

SEQUENCE LISTING

<110> Cindy Castado
Joelle Thonnard

<120> Novel Compounds

<130> B45292

<150> GB 0200025.5

<151> 2002-01-02

<160> 87

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 453

<212> DNA

<213> Haemophilus influenzae

<400> 1

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ttgaagaaag	tttcaaaaaa	tgttgaaatt	ttattttatg	atcatggtaa	agcaaaaagt	180
tattgctgga	aaaaaacact	tgtcaaaaat	taccgtttag	ttcactatcg	taaaccctct	240
aaaacgtcta	aacgtgcaat	catgtgtaca	acagcttatt	taattacttt	atctggcgct	300
caaaaactcc	tacaaatagc	ctatcctatc	cgtatgcctg	ctgactactt	aactgggtgct	360
ttacaattaa	ctggactaaa	ggcttatggg	gttgaaccac	cttgtgtatt	taaaggcgca	420
atttcagaaa	ttgatgcaat	ggagcaacgc	taa			453

<210> 2

<211> 150

<212> PRT

<213> Haemophilus influenzae

<400> 2

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			20					25					30		
Phe	Glu	Ala	Ile	Val	Lys	Asp	Ser	Leu	Lys	Lys	Val	Ser	Lys	Asn	Val
		35					40					45			
Glu	Ile	Leu	Phe	Tyr	Asp	His	Gly	Lys	Ala	Lys	Ser	Tyr	Cys	Trp	Lys
	50				55						60				
Lys	Thr	Leu	Val	Lys	Asn	Tyr	Arg	Leu	Val	His	Tyr	Arg	Lys	Pro	Ser
65					70				75					80	
Lys	Thr	Ser	Lys	Arg	Ala	Ile	Met	Cys	Thr	Thr	Ala	Tyr	Leu	Ile	Thr
			85						90					95	
Leu	Ser	Gly	Ala	Gln	Lys	Leu	Leu	Gln	Ile	Ala	Tyr	Pro	Ile	Arg	Met
			100					105					110		
Pro	Ala	Asp	Tyr	Leu	Thr	Gly	Ala	Leu	Gln	Leu	Thr	Gly	Leu	Lys	Ala
		115					120					125			

Tyr Gly Val Glu Pro Pro Cys Val Phe Lys Gly Ala Ile Ser Glu Ile
130 135 140
Asp Ala Met Glu Gln Arg
145 150

<210> 3
<211> 1032
<212> DNA
<213> Haemophilus influenzae

<400> 3
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aaaaaaaaacg gattaaacag aataacaaat gttcctagaa gcatcctctt cctccgccaa 120
gacggaaaaa ttggggatta tgtgtgtgagc tcatttgtat tccgtgagat aaaaaaattt 180
aatccccaca ttaaaatttg tgtaatttgt accaaacaaa atgcttatct ttttaaacia 240
aatccatata tcgatcaact ttactatgta aaaaagaaaa gtattttgga ttacatcaaa 300
tgtggtctag caattcaaaa agaacaatat gatttagtga ttgatccgac gattatgatt 360
cgtaatcgcg atcttttact tttacgctta atcaatgcc a gcattatat tggctaccaa 420
aaagccaatt atggttttatt taatattaat ctggaggagc aatttcactt ttcggaactc 480
tataaactcg ccttagaaaa agtgaatatt acggtacaag atataagcta tgacatccca 540
tttgataagc aaagtgcggt cgaaatttct gaatttttgc agaaaaacca actagaaaag 600
tatattgcta ttaattttta tgggtgctgca agaatacaaaa aagtaaacia tgacaacatc 660
aaaaaatatt tagattatct cacgcaagtc cgcggaggaa aaaagctggg gctattaagc 720
tactctgaag taacagagaa attaacacia ttgtcagccg attatccgca tatttttgtc 780
catccaacia ccaagatctt tcataccatt gaattgattc gccactgtga tcaattaatc 840
tctacagaca cgtctactgt acatattgct tcagggttita ataaaccaat tattgggtatt 900
tataaagaag atcctattgc gtttacacat tggcaacca gaagtcgggc agaaacgcac 960
atacttttct ataaagaaaa tattaatgag ctctcacctg aacaaattga cctgcatgg 1020
cttgtcaaat ag 1032

<210> 4
<211> 343
<212> PRT
<213> Haemophilus influenzae

<400> 4
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Tyr Phe Leu Asp Lys Lys Asn Gly Leu Asn Arg Ile Thr Asn Val Pro
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Arg Ser Ile Leu Phe Leu Arg Gln Asp Gly Lys Ile Gly Asp Tyr Val
35 40 45
Val Ser Ser Phe Val Phe Arg Glu Ile Lys Lys Phe Asn Pro His Ile
50 55 60
Lys Ile Gly Val Ile Cys Thr Lys Gln Asn Ala Tyr Leu Phe Lys Gln
65 70 75 80
Asn Pro Tyr Ile Asp Gln Leu Tyr Tyr Val Lys Lys Lys Ser Ile Leu
85 90 95
Asp Tyr Ile Lys Cys Gly Leu Ala Ile Gln Lys Glu Gln Tyr Asp Leu
100 105 110
Val Ile Asp Pro Thr Ile Met Ile Arg Asn Arg Asp Leu Leu Leu
115 120 125
Arg Leu Ile Asn Ala Lys His Tyr Ile Gly Tyr Gln Lys Ala Asn Tyr
130 135 140
Gly Leu Phe Asn Ile Asn Leu Glu Gly Gln Phe His Phe Ser Glu Leu

Tyr Leu Glu Gly Ala Ile Ile Glu Lys Ile Val Val Arg Gln Pro Lys
 20 25 30
 Leu Arg Trp Met Val Ser Glu Glu Leu Ala Gln Ile Thr Gln Gln Lys
 35 40 45
 Val Ile Ala Leu Ser Arg Arg Ala Lys Tyr Leu Ile Ile Gln Leu Glu
 50 55 60
 Thr Gly Tyr Met Ile Gly His Leu Gly Met Ser Gly Ser Leu Arg Val
 65 70 75 80
 Val Glu Lys Gly Asp Leu Ile Asp Lys His Asp His Leu Asp Ile Val
 85 90 95
 Val Asn Asn Gly Lys Val Val Arg Tyr Asn Asp Pro Arg Arg Phe Gly
 100 105 110
 Ala Trp Leu Trp Thr Glu Lys Leu Asn Glu Phe Pro Leu Phe Leu Lys
 115 120 125
 Leu Gly Pro Glu Pro Leu Ser Glu Glu Phe Asp Ser Asp Tyr Leu Trp
 130 135 140
 Gln Lys Ser Arg Lys Lys Gln Thr Ala Leu Lys Thr Phe Leu Met Asp
 145 150 155 160
 Asn Ala Val Val Val Gly Val Gly Asn Ile Tyr Ala Asn Glu Thr Leu
 165 170 175
 Phe Leu Cys Asn Leu His Pro Gln Lys Thr Ala Gly Ser Leu Thr Lys
 180 185 190
 Ala Gln Cys Gly Gln Leu Val Glu Gln Ile Lys Gln Val Leu Ser Asn
 195 200 205
 Ala Ile Gln Gln Gly Gly Thr Thr Leu Lys Asp Phe Leu Gln Pro Asp
 210 215 220
 Gly Arg Pro Gly Tyr Phe Val Gln Glu Leu Arg Val Tyr Gly Asn Lys
 225 230 235 240
 Asp Lys Pro Cys Pro Thr Cys Gly Thr Lys Ile Glu Ser Leu Val Ile
 245 250 255
 Gly Gln Arg Asn Ser Phe Tyr Cys Pro Lys Cys Gln Lys Arg
 260 265 270

<210> 7

<211> 726

<212> DNA

<213> Haemophilus influenzae

<400> 7

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cgcattgag	c aaggggaaaa	agtggatttg	tttgcctctg	ccaatgatgc	gcattcttagg	180
catttacaag	c cgcgatatcc	tcatattcaa	cttgtgcctt	ttgctacaaa	tcgtttatgt	240
ttaattgcaa	a agaaatcgg	gattactcac	catgatgaga	attggttgac	attattgatg	300
tcgccccact	t acgcttagg	agtatcgaca	cctaaggcag	atccttgtgg	agattatact	360
ttggcattat	t ttcgaatat	tgaaaaacgg	catatgggct	atggctcgga	attaaaagaa	420
aaagcaatgg	c aatagttgg	tgggtccggat	tctatcacta	ttccaacagg	acgaaatacc	480
gcagagtggc	t ttttgagca	gaattatgct	gatcttttca	ttggttatgc	gagtaatcat	540
caatctttgc	g ttcagcattc	tgatatttgt	gttttggata	ttcctgatga	gtataatgtg	600
agggcgaa	c taccattagc	agcttttact	gcggaagcat	tacgccttgt	ggactccttg	660
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<210> 8

<211> 241

<212> PRT
 <213> Haemophilus influenzae

<400> 8

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Gln Gln Ala Leu Ile Gln Gln Tyr His Leu Gln Val Glu Ile Glu Phe
          20          25          30
Gly Pro Ala Gly Leu Leu Cys Gln Arg Ile Glu Gln Gly Glu Lys Val
          35          40          45
Asp Leu Phe Ala Ser Ala Asn Asp Ala His Leu Arg His Leu Gln Ala
          50          55          60
Arg Tyr Pro His Ile Gln Leu Val Pro Phe Ala Thr Asn Arg Leu Cys
          65          70          75          80
Leu Ile Ala Lys Lys Ser Val Ile Thr His His Asp Glu Asn Trp Leu
          85          90          95
Thr Leu Leu Met Ser Pro His Leu Arg Leu Gly Val Ser Thr Pro Lys
          100          105          110
Ala Asp Pro Cys Gly Asp Tyr Thr Leu Ala Leu Phe Ser Asn Ile Glu
          115          120          125
Lys Arg His Met Gly Tyr Gly Ser Glu Leu Lys Glu Lys Ala Met Ala
          130          135          140
Ile Val Gly Gly Pro Asp Ser Ile Thr Ile Pro Thr Gly Arg Asn Thr
          145          150          155          160
Ala Glu Trp Leu Phe Glu Gln Asn Tyr Ala Asp Leu Phe Ile Gly Tyr
          165          170          175
Ala Ser Asn His Gln Ser Leu Arg Gln His Ser Asp Ile Cys Val Leu
          180          185          190
Asp Ile Pro Asp Glu Tyr Asn Val Arg Ala Asn Tyr Thr Leu Ala Ala
          195          200          205
Phe Thr Ala Glu Ala Leu Arg Leu Val Asp Ser Leu Leu Cys Leu Thr
          210          215          220
Cys Gly Gln Lys Tyr Leu Arg Asp Cys Gly Phe Leu Pro Ala Asn His
          225          230          235          240
Ser
  
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<210> 9

<211> 741

<212> DNA

<213> Haemophilus influenzae

<400> 9

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aaaggtaaaa ccacattatt gcattctctt gctcatgtgt tacctgttat gtctggacag      180
attaggcaac aaggtcatat tggttttgtg ccacagtctt tttcgtcgcc agattatccc      240
gtgtttagaga ttgttttaat ggggcgagca agcaaaattg gagcatttaa cttaccaagt      300
aaaacggatg aaacagtcgc attacagatg ttggcgtgct tagacatcct gcatttagct      360
gagcgcaata tcaatatgct ttcgggcggt caacgccaac ttgtgctcat cgctcgtgca      420
cttgcgacag aatgtcaggt cctcatttta gatgaaccta cagcagcatt ggatgtttat      480
aatcaatagc gtgtcttaca acttatacgt tttcttgcaa cggaacaaaa aatgaccatt      540
attttttcca ctcatgatcc ttatcacagt ttatgtgtgg cagataatgt gttattgcta      600
ttgcctaacc aacaatggaa atatggaata gccagtcaaa ttttaacgga atctcatttg      660
aaacaagcgt ataatgtacc gattaaatat tctatgattg aagaacagca gggttttagtc      720
  
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cccatcttta ccatacagta a

741

<210> 10
 <211> 246
 <212> PRT
 <213> Haemophilus influenzae

<220>
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 <222> (1)...(246)
 <223> Xaa = Any Amino Acid

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 Lys Pro Leu Tyr Leu Pro Leu Thr Phe Gln Cys Lys Lys Gly Glu Val
 20 25 30
 Ile Ser Val Phe Gly Thr Asn Gly Lys Gly Lys Thr Thr Leu Leu His
 35 40 45
 Ser Leu Ala His Val Leu Pro Val Met Ser Gly Gln Ile Arg Gln Gln
 50 55 60
 Gly His Ile Gly Phe Val Pro Gln Ser Phe Ser Ser Pro Asp Tyr Pro
 65 70 75 80
 Val Leu Glu Ile Val Leu Met Gly Arg Ala Ser Lys Ile Gly Ala Phe
 85 90 95
 Asn Leu Pro Ser Lys Thr Asp Glu Thr Val Ala Leu Gln Met Leu Ala
 100 105 110
 Cys Leu Asp Ile Leu His Leu Ala Glu Arg Asn Ile Asn Met Leu Ser
 115 120 125
 Gly Gly Gln Arg Gln Leu Val Leu Ile Ala Arg Ala Leu Ala Thr Glu
 130 135 140
 Cys Gln Val Leu Ile Leu Asp Glu Pro Thr Ala Ala Leu Asp Val Tyr
 145 150 155 160
 Asn Gln Xaa Arg Val Leu Gln Leu Ile Arg Phe Leu Ala Thr Glu Gln
 165 170 175
 Lys Met Thr Ile Ile Phe Ser Thr His Asp Pro Tyr His Ser Leu Cys
 180 185 190
 Val Ala Asp Asn Val Leu Leu Leu Leu Pro Asn Gln Gln Trp Lys Tyr
 195 200 205
 Gly Ile Ala Ser Gln Ile Leu Thr Glu Ser His Leu Lys Gln Ala Tyr
 210 215 220
 Asn Val Pro Ile Lys Tyr Ser Met Ile Glu Glu Gln Gln Val Leu Val
 225 230 235 240
 Pro Ile Phe Thr Ile Gln
 245

<210> 11
 <211> 1023
 <212> DNA
 <213> Haemophilus influenzae

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 tccattttat ctaagccttt tctttcgcaa cacgcgtctt ttacacctat ggaataccat 180

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attgtttggc atgtacgctt accacgcac accacgcac attatggcat ttttttcagg ggggatctga 240
gcatgagtg gtgcaacact acagggcggt tttcataatc cccttggtga tcctcatatt 300
attggtgtca catcaggggc agtttttgga ggcagtttag caattttatt aggattccca 360
tcttatttat tgattctatc cacattttct tttggtttat tgacattatt cttgatctat 420
gtaaccacaa tgttcatcgg aaaaggcaat cgtattgtat tagtttttagc ggggtgtcatt 480
ttaagtgggt tcttttagcac tctagtggag ttaatccaat atttagcgga tgcagaagaa 540
gttctgccga gcattgtatt ttggttatta ggaagttttg ccaccactag ttgggcaaaa 600
ctagctatat tgttaccctg cgtttttatt gcagcttatt tattattccg tttacgggtgg 660
catattaatg tgttatcgct aggtgatatg caagcaaaaa tgttaggcgt ttccattaag 720
aaaatgcgtt ggtttgtttt gctactttgt gcattgcttg tagcaacaca agtcgctggt 780
agtgggagta ttgggtggat agggccttgtt attcctcatt tgacacggtt ttttgtagga 840
agtgatcacc gttatctatt gcccgcctcc tttttgattg gtgggatttt catgattggt 900
attgatacac ttgcacgtac gttaacttct gcagaaattc ctgtaggat tatcaccgct 960
cttttaggag caccattttt taccttgctc ctattaaaaa cttatcgaaa gaagtcatta 1020
tga 1023

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<210> 12
<211> 340
<212> PRT
<213> Haemophilus influenzae

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<220>
<221> VARIANT
<222> (1)...(340)
<223> Xaa = Any Amino Acid

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20 25 30
Ser Leu Ser Thr Gly Lys Val Met Ser Ile Leu Ser Lys Pro Phe Leu
35 40 45
Ser Gln His Ala Ser Phe Thr Pro Met Glu Tyr His Ile Val Trp His
50 55 60
Val Arg Leu Pro Arg Ile Ile Met Ala Phe Phe Ser Gly Gly Ile Xaa
65 70 75 80
Ala Met Ser Gly Ala Thr Leu Gln Gly Val Phe His Asn Pro Leu Val
85 90 95
Asp Pro His Ile Ile Gly Val Thr Ser Gly Ala Val Phe Gly Gly Ser
100 105 110
Leu Ala Ile Leu Leu Gly Phe Pro Ser Tyr Leu Leu Ile Leu Ser Thr
115 120 125
Phe Ser Phe Gly Leu Leu Thr Leu Phe Leu Ile Tyr Val Thr Thr Met
130 135 140
Phe Ile Gly Lys Gly Asn Arg Ile Val Leu Val Leu Ala Gly Val Ile
145 150 155 160
Leu Ser Gly Phe Phe Ser Thr Leu Val Ser Leu Ile Gln Tyr Leu Ala
165 170 175
Asp Ala Glu Glu Val Leu Pro Ser Ile Val Phe Trp Leu Leu Gly Ser
180 185 190
Phe Ala Thr Thr Ser Trp Ala Lys Leu Ala Ile Leu Leu Pro Cys Val
195 200 205
Phe Ile Ala Ala Tyr Leu Leu Phe Arg Leu Arg Trp His Ile Asn Val
210 215 220

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Leu Ser Leu Gly Asp Met Gln Ala Lys Met Leu Gly Val Ser Ile Lys
 225 230 235 240
 Lys Met Arg Trp Phe Val Leu Leu Leu Cys Ala Leu Leu Val Ala Thr
 245 250 255
 Gln Val Ala Val Ser Gly Ser Ile Gly Trp Ile Gly Leu Val Ile Pro
 260 265 270
 His Leu Thr Arg Phe Phe Val Gly Ser Asp His Arg Tyr Leu Leu Pro
 275 280 285
 Ala Ser Phe Leu Ile Gly Gly Ile Phe Met Ile Val Ile Asp Thr Leu
 290 295 300
 Ala Arg Thr Leu Thr Ser Ala Glu Ile Pro Val Gly Ile Ile Thr Ala
 305 310 315 320
 Leu Leu Gly Ala Pro Ile Phe Thr Leu Leu Leu Leu Lys Thr Tyr Arg
 325 330 335
 Lys Lys Ser Leu
 340

<210> 13
 <211> 942
 <212> DNA
 <213> Haemophilus influenzae

<400> 13
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 gatgaagtta atcgtgttgt tgtctgacag catcagactt taaatctcct tgcccagctt 180
 gatgcaaagg aaagtgtagt cggagtgtta tcaagttgga aaaaacaatt agggaaaaaac 240
 tatgcaccaa aagaaatgat tgagcaaadc gaacaggctg gtgtgcctgt tgtagccatt 300
 tctttgcgtg aagataaaaa aggtgaagaa ggaaaagtca acccagaaat ggaagatgaa 360
 gaagttgcct ataataatgg tttgaaacaa ggcattttatt taattggtga agtaattaat 420
 cgacaagcgc aagcccaaaa gctagttact tacacttttg aacagcgtga attagttagt 480
 caacgtttta gtaagggtgc tgatgagcag cgtgttaggg tctatatattgc aaatccagat 540
 ttagcgactt atggttcttg aaaatataca ggggttaatga tgcttcatgc tggagcgaag 600
 aatgtggcag ctgaaacaat aaaagggttt aaacaagttt cgattgagca agtgattcat 660
 tggaaatcct cagttatctt cgtacaggaa cgttatcctc aggttatcga gcaaattaaa 720
 aaggatccct cttggcaaat tattgatgcg gtgaaaaatc aacgtatcta tttaatgccg 780
 gaatatgcaa aagcgtgggg atatccaatg cctgaagcat tagcgattgg tgaattatgg 840
 ttagcaaaaac aactttaccc tgaattgttt gcagatgttg atttagagga aaaagtaaac 900
 caatactata aattgttcta tcgtatgcca tataaccagt aa 942

<210> 14
 <211> 313
 <212> PRT
 <213> Haemophilus influenzae

<220>
 <221> VARIANT
 <222> (1)...(313)
 <223> Xaa = Any Amino Acid

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 20 25 30

Leu	Gly	Arg	Lys	Val	Thr	Ile	Pro	Asp	Glu	Val	Asn	Arg	Val	Val	Val
		35					40				45				
Xaa	Gln	His	Gln	Thr	Leu	Asn	Leu	Leu	Ala	Gln	Leu	Asp	Ala	Lys	Glu
	50					55					60				
Ser	Val	Val	Gly	Val	Leu	Ser	Ser	Trp	Lys	Lys	Gln	Leu	Gly	Lys	Asn
	65				70					75					80
Tyr	Ala	Pro	Lys	Glu	Met	Ile	Glu	Gln	Ile	Glu	Gln	Ala	Gly	Val	Pro
				85					90					95	
Val	Val	Ala	Ile	Ser	Leu	Arg	Glu	Asp	Lys	Lys	Gly	Glu	Glu	Gly	Lys
			100					105						110	
Val	Asn	Pro	Glu	Met	Glu	Asp	Glu	Val	Ala	Tyr	Asn	Asn	Gly	Leu	
		115					120				125				
Lys	Gln	Gly	Ile	Tyr	Leu	Ile	Gly	Glu	Val	Ile	Asn	Arg	Gln	Ala	Gln
	130					135					140				
Ala	Gln	Lys	Leu	Val	Thr	Tyr	Thr	Phe	Glu	Gln	Arg	Glu	Leu	Val	Ser
	145				150					155					160
Gln	Arg	Leu	Ser	Lys	Val	Pro	Asp	Glu	Gln	Arg	Val	Arg	Val	Tyr	Ile
			165					170						175	
Ala	Asn	Pro	Asp	Leu	Ala	Thr	Tyr	Gly	Ser	Gly	Lys	Tyr	Thr	Gly	Leu
			180					185					190		
Met	Met	Leu	His	Ala	Gly	Ala	Lys	Asn	Val	Ala	Ala	Glu	Thr	Ile	Lys
		195					200					205			
Gly	Phe	Lys	Gln	Val	Ser	Ile	Glu	Gln	Val	Ile	His	Trp	Asn	Pro	Ala
	210					215					220				
Val	Ile	Phe	Val	Gln	Glu	Arg	Tyr	Pro	Gln	Val	Ile	Glu	Gln	Ile	Lys
	225				230				235						240
Lys	Asp	Pro	Ser	Trp	Gln	Ile	Ile	Asp	Ala	Val	Lys	Asn	Gln	Arg	Ile
			245					250						255	
Tyr	Leu	Met	Pro	Glu	Tyr	Ala	Lys	Ala	Trp	Gly	Tyr	Pro	Met	Pro	Glu
			260					265					270		
Ala	Leu	Ala	Ile	Gly	Glu	Leu	Trp	Leu	Ala	Lys	Gln	Leu	Tyr	Pro	Glu
		275					280					285			
Leu	Phe	Ala	Asp	Val	Asp	Leu	Glu	Glu	Lys	Val	Asn	Gln	Tyr	Tyr	Lys
	290					295					300				
Leu	Phe	Tyr	Arg	Met	Pro	Tyr	Asn	Gln							
	305				310										

<210> 15

<211> 558

<212> DNA

<213> Haemophilus influenzae

<400> 15

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ggccaagggt	tagatgctaa	aataggtcaa	gtgaataatc	aatttacaca	agttgatacc	180
cgtttaaatc	gaacagattt	acgtattaac	cgccttggcg	caagtgctgc	ggcgttggct	240
tcattaaaac	ctgcacaatt	aggcgaagat	gataaatttg	cattatcttt	gggcgttggt	300
agttataaaa	atgcgcaggc	gatggcaatg	ggggctgtgt	ttaagccagc	tgaaaacgta	360
ttgcttaatg	tagcggggag	tttttctggt	tcggaaaaaa	cctttggcgc	aggtgtttct	420
tggaaattcg	gcagcaaadc	caaacctgcg	gtttcaacac	aaagtgcggt	caattctgcg	480
gaagttttgc	aactgcgaca	agaaatatcg	gcaatgcaaa	aagaattggc	tgaattgaaa	540
aaagcattaa	gaaaataa					558

<210> 16

<211> 185
 <212> PRT
 <213> Haemophilus influenzae

<400> 16
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 Asp Lys Thr Trp Gln Leu Gln Thr Gly Gln Gly Leu Asp Ala Lys Ile
 35 40 45
 Gly Gln Val Asn Asn Gln Phe Thr Gln Val Asp Thr Arg Leu Asn Arg
 50 55 60
 Thr Asp Leu Arg Ile Asn Arg Leu Gly Ala Ser Ala Ala Ala Leu Ala
 65 70 75 80
 Ser Leu Lys Pro Ala Gln Leu Gly Glu Asp Asp Lys Phe Ala Leu Ser
 85 90 95
 Leu Gly Val Gly Ser Tyr Lys Asn Ala Gln Ala Met Ala Met Gly Ala
 100 105 110
 Val Phe Lys Pro Ala Glu Asn Val Leu Leu Asn Val Ala Gly Ser Phe
 115 120 125
 Ser Gly Ser Glu Lys Thr Phe Gly Ala Gly Val Ser Trp Lys Phe Gly
 130 135 140
 Ser Lys Ser Lys Pro Ala Val Ser Thr Gln Ser Ala Val Asn Ser Ala
 145 150 155 160
 Glu Val Leu Gln Leu Arg Gln Glu Ile Ser Ala Met Gln Lys Glu Leu
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 Ala Glu Leu Lys Lys Ala Leu Arg Lys
 180 185

<210> 17
 <211> 2373
 <212> DNA
 <213> Haemophilus influenzae

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 cgctgtttgg atactttact tgagccaagc aaagatgccg tattggaaga aatgcgtttt 180
 caaaaagaag aattggcatt caccgaattg gatgaccttc cccttaaaaa aattaccggg 240
 catgtttttt ataacacctc aaaatggaca ttaaaatccc tctatcaaac cgccagcaat 300
 acgccgcagt atatgctggc caattttgaa gaatatcttg atggtttcag caccaacatt 360
 catgaaatca tcaactgctt caagctgctg gaacaaatcc gccatatgtc ccataaaaaat 420
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 caacaagacc ctgagggcaa caaattacca gcgctgacca atctgggcat gggctatgta 540
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 tcgcaaaact ttattgagca aaaatatccg ctatctgaat cacaaggcga gcgttccatc 780
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 ccagattact ggggcaatgt agaaaccctt gatgctaccc cacgctccag cgatggacag 1080
 ctgctattcc taatggaaat ggtcagcaaa atgaaatcgc cgaatgacaa caaaatcggc 1140

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gccgcacttt	ttcagacggc	atcaaccttg	ctcgaacatt	tcggcgaaaca	acaatttgac	1860
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aaaccattac	gcagccttgc	agaagttgcc	caagatatatt	tggcggttaga	aaaacaggct	2340
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<210> 18

<211> 790

<212> PRT

<213> Haemophilus influenzae

<400> 18

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			20					25					30		
Val	Ile	Leu	Pro	Met	Phe	Val	Leu	Arg	Arg	Leu	Asp	Thr	Leu	Leu	Glu
		35					40					45			
Pro	Ser	Lys	Asp	Ala	Val	Leu	Glu	Glu	Met	Arg	Phe	Gln	Lys	Glu	Glu
	50					55					60				
Leu	Ala	Phe	Thr	Glu	Leu	Asp	Asp	Leu	Pro	Leu	Lys	Lys	Ile	Thr	Gly
65				70				75					80		
His	Val	Phe	Tyr	Asn	Thr	Ser	Lys	Trp	Thr	Leu	Lys	Ser	Leu	Tyr	Gln
			85					90					95		
Thr	Ala	Ser	Asn	Thr	Pro	Gln	Tyr	Met	Leu	Ala	Asn	Phe	Glu	Glu	Tyr
			100					105					110		
Leu	Asp	Gly	Phe	Ser	Thr	Asn	Ile	His	Glu	Ile	Ile	Asn	Cys	Phe	Lys
		115				120						125			
Leu	Arg	Glu	Gln	Ile	Arg	His	Met	Ser	His	Lys	Asn	Val	Leu	Leu	Ser
	130					135					140				
Val	Leu	Glu	Lys	Phe	Val	Ser	Pro	Tyr	Ile	Asn	Leu	Thr	Pro	Lys	Glu
145				150				155						160	
Gln	Gln	Asp	Pro	Glu	Gly	Asn	Lys	Leu	Pro	Ala	Leu	Thr	Asn	Leu	Gly
			165					170						175	
Met	Gly	Tyr	Val	Phe	Glu	Glu	Leu	Ile	Arg	Lys	Phe	Asn	Glu	Glu	Asn
		180						185					190		
Asn	Glu	Glu	Ala	Gly	Glu	His	Phe	Thr	Pro	Arg	Glu	Val	Ile	Glu	Leu
	195					200					205				
Met	Thr	His	Leu	Val	Phe	Asp	Pro	Leu	Lys	Asp	Gln	Ile	Pro	Ala	Ile

210	Ile Thr Ile Tyr Asp	215	Pro Ala Cys Gly Ser	220	Gly Gly Met Leu Thr Glu
225	Ser Gln Asn Phe Ile	230	Glu Gln Lys Tyr Pro	235	Leu Ser Glu Ser Gln Gly
		245	Leu Phe Gly Lys Glu	250	Thr Asn Asp Glu Thr Tyr
		260		265	
Ala Ile Cys Lys Ser Asp Met Met Ile Lys Gly Asp Asn Pro Glu Asn		275		280	
		285		290	
Ile Lys Val Gly Ser Thr Leu Ala Thr Asp Ser Phe Gln Gly Asn His		295		300	
Phe Asp Phe Met Leu Ser Asn Pro Pro Tyr Gly Lys Ser Trp Ser Lys		305		315	
		310		320	
Asp Gln Ala Tyr Ile Lys Asp Gly Asn Glu Val Ile Asp Ser Arg Phe		325		330	
		335		340	
Lys Val Thr Leu Pro Asp Tyr Trp Gly Asn Val Glu Thr Leu Asp Ala		345		350	
		355		360	
Thr Pro Arg Ser Ser Asp Gly Gln Leu Leu Phe Leu Met Glu Met Val		365		370	
		375		380	
Ser Lys Met Lys Ser Pro Asn Asp Asn Lys Ile Gly Ser Arg Val Ala		385		395	
		390		400	
Ser Val His Asn Gly Ser Ser Leu Phe Thr Gly Asp Ala Gly Ser Gly		405		410	
		415		420	
Glu Ser Asn Ile Arg Arg His Ile Ile Glu Lys Asp Leu Leu Glu Ala		425		430	
		435		440	
Ile Val Gln Leu Pro Asn Asn Leu Phe Tyr Asn Thr Gly Ile Thr Thr		445		450	
		455		460	
Tyr Ile Trp Leu Leu Ser Asn Asn Lys Pro Glu Ala Arg Lys Gly Lys		465		470	
		475		480	
Val Gln Leu Ile Asp Ala Ser Leu Leu Phe Arg Lys Leu Arg Lys Asn		485		490	
		495		500	
Leu Gly Asp Lys Asn Cys Glu Phe Val Pro Glu His Ile Ala Glu Ile		505		510	
		515		520	
Thr Gln Asn Tyr Leu Asp Phe Thr Ala Lys Ala Arg Glu Thr Asp Ser		525		530	
		535		540	
Gln Asn Glu Ala Val Gly Leu Ala Ser Gln Ile Phe Asp Asn Gln Asp		545		550	
		555		560	
Phe Gly Tyr Tyr Lys Val Thr Ile Glu Arg Pro Asp Arg Arg Ser Ala		565		570	
		575		580	
Gln Phe Thr Ala Glu Asn Ile Ser Pro Leu Arg Phe Asp Lys Ala Leu		585		590	
		595		600	
Phe Glu Pro Met Gln Tyr Leu Tyr Arg Gln Tyr Gly Glu Gln Ile Tyr		605		610	
		615		620	
Asn Ala Gly Phe Leu Ala Gln Thr Glu Gln Glu Ile Thr Ala Trp Cys		625		630	
		635		640	
Glu Ala Gln Gly Ile Ala Leu Asn Asn Lys Asn Lys Thr Lys Leu Leu		645		650	
		655			
Asp Val Lys Thr Trp Glu Lys Ala Ala Ala Leu Phe Gln Thr Ala Ser					
Thr Leu Leu Glu His Phe Gly Glu Gln Gln Phe Asp Asp Phe Asn Gln					
Phe Lys Gln Ala Val Glu Cys Arg Leu Lys Ala Glu Lys Ile Pro Leu					
Ser Ala Thr Glu Lys Lys Ala Val Phe Asn Ala Val Ser Trp Tyr Asp					

Glu Asn Ser Ala Lys Val Ile Ala Lys Thr Leu Lys Leu Lys Pro Asn
 660 665 670
 Glu Leu Asp Ala Leu Cys Gln Arg Tyr Gln Cys Gln Ala Asp Glu Leu
 675 680 685
 Ala Asp Phe Gly Tyr Tyr Ala Thr Gly Lys Ala Gly Glu Tyr Ile Leu
 690 695 700
 Tyr Glu Thr Ser Ser Asp Leu Arg Asp Ser Glu Ser Ile Pro Leu Lys
 705 710 715 720
 Gln Asn Ile His Asp Tyr Phe Lys Ala Glu Val Gln Ala His Ile Ser
 725 730 735
 Glu Ala Trp Leu Asn Met Glu Ser Val Lys Ile Gly Tyr Glu Ile Ser
 740 745 750
 Phe Asn Lys Tyr Phe Tyr Arg His Lys Pro Leu Arg Ser Leu Ala Glu
 755 760 765
 Val Ala Gln Asp Ile Leu Ala Leu Glu Lys Gln Ala Asp Gly Leu Ile
 770 775 780
 Ser Glu Ile Leu Glu Ala
 785 790

<210> 19
 <211> 818
 <212> DNA
 <213> Haemophilus influenzae

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 ggtgtggcag ataatggcga aatccaagac ttgaatagcc ttggcgataa attagatgat 180
 tatcggaat tggttttcga ttttattgca ccgccttgtc ggattggact ggaagaaatt 240
 ctggttgatg gaaaattagt tttcttattc cacgtagagc aagatttaga gcgtatttat 300
 tgtcgcaaag acaatgaaaa tgtgttctta cgtgtagcag atagtaatcg aggcctctc 360
 accagagaac aaatcaaaaa tcttgaatat gataaaaaata tccgtctatt tgaagatgaa 420
 atagttcctg attttaatga agaagattta gatcaagaat tattagagct atataaaaag 480
 aaagttaatt ttacctccga taatatctta gatttattat acaagcgaaa tttattaacc 540
 aaaaaggaag gttgttatca gtttaaaaaa tcagccattt tactcttttc taccatgccg 600
 gaacgttaca ttccttcagc atcagtcgcc tatgttcggt atgaaggtag agtagcgaaa 660
 gtcggtactg agcataatgt gataaaagac caacgttttg aaaataatat tccaaagcta 720
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 aatcaggga aatttatcaa agtaccggaa tctcctga 818

<210> 20
 <211> 272
 <212> PRT
 <213> Haemophilus influenzae

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 20 25 30
 Ala Asp Gly Gly Val Leu Ala Phe Gly Val Ala Asp Asn Gly Glu Ile
 35 40 45
 Gln Asp Leu Asn Ser Leu Gly Asp Lys Leu Asp Asp Tyr Arg Lys Leu
 50 55 60
 Val Phe Asp Phe Ile Ala Pro Pro Cys Arg Ile Gly Leu Glu Glu Ile

65					70					75				80
Leu	Val	Asp	Gly	Lys	Leu	Val	Phe	Leu	Phe	His	Val	Glu	Gln	Asp
				85					90					95
Glu	Arg	Ile	Tyr	Cys	Arg	Lys	Asp	Asn	Glu	Asn	Val	Phe	Leu	Arg
			100					105					110	
Ala	Asp	Ser	Asn	Arg	Gly	Pro	Leu	Thr	Arg	Glu	Gln	Ile	Lys	Asn
			115				120					125		
Glu	Tyr	Asp	Lys	Asn	Ile	Arg	Leu	Phe	Glu	Asp	Glu	Ile	Val	Pro
	130				135						140			
Phe	Asn	Glu	Glu	Asp	Leu	Asp	Gln	Glu	Leu	Leu	Glu	Leu	Tyr	Lys
145					150				155					160
Lys	Val	Asn	Phe	Thr	Ser	Asp	Asn	Ile	Leu	Asp	Leu	Leu	Tyr	Lys
				165				170						175
Asn	Leu	Leu	Thr	Lys	Lys	Glu	Gly	Cys	Tyr	Gln	Phe	Lys	Lys	Ser
			180					185					190	Ala
Ile	Leu	Leu	Phe	Ser	Thr	Met	Pro	Glu	Arg	Tyr	Ile	Pro	Ser	Ala
	195					200						205		Ser
Val	Arg	Tyr	Val	Arg	Tyr	Glu	Gly	Thr	Val	Ala	Lys	Val	Gly	Thr
	210					215					220			Glu
His	Asn	Val	Ile	Lys	Asp	Gln	Arg	Phe	Glu	Asn	Asn	Ile	Pro	Lys
225					230					235				240
Ile	Glu	Glu	Leu	Thr	Tyr	Phe	Leu	Arg	Ala	Ser	Leu	Arg	Asp	Tyr
			245					250					255	Tyr
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			260					265					270	Pro

<210> 21
 <211> 636
 <212> DNA
 <213> Haemophilus influenzae

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aaacatttcg	acgatcgtct	tgaaattagt	aatagtggcc	ctctccctgc	tcaagtcacc														180
attgaaaata	ttaaaacgga	acgattcgct	cggaatccac	gtatagcacg	agttttagag														240
gatcttgggt	atgtccgtca	gcttaatgaa	ggcgtttccc	gtatttatga	gtcaatggaa														300
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gcgtatttaa	atgcctttat	tcagcaaggt	attattgaaa	gacaaagtgt	aaaacagcgt														600
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<210> 22
 <211> 211
 <212> PRT
 <213> Haemophilus influenzae

<400> 22														
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Ala	Trp	Leu	Glu	Gly	Val	Val	Asn	Ala	Leu	Cys	His	Arg	Ser	Tyr
			20				25				30			Asn
Val	Gln	Gly	Asn	Val	Ile	Tyr	Ile	Lys	His	Phe	Asp	Asp	Arg	Leu
														Glu

<213> Haemophilus influenzae

<400> 24

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Leu	Gly	Glu	Val	Pro	Ser	His	Trp	Glu	Leu	Lys	Arg	Leu	Lys	Gln	Leu	20	25	30	
Phe	Val	Glu	Lys	Lys	His	Lys	Gln	Ser	Leu	Ser	Leu	Asn	Cys	Gly	Ala	35	40	45	
Ile	Ser	Phe	Gly	Lys	Val	Ile	Glu	Lys	Ser	Asp	Asp	Lys	Val	Thr	Glu	50	55	60	
Ala	Thr	Lys	Arg	Ser	Tyr	Gln	Glu	Val	Leu	Lys	Gly	Glu	Phe	Leu	Ile	65	70	75	80
Asn	Pro	Leu	Asn	Leu	Asn	Tyr	Asp	Leu	Ile	Ser	Leu	Arg	Ile	Ala	Leu	85	90	95	
Ser	Glu	Ile	Asp	Val	Val	Val	Ser	Ala	Gly	Tyr	Ile	Val	Leu	Lys	Glu	100	105	110	
Lys	Gln	Ile	Ile	Asn	Lys	Lys	Tyr	Phe	Ser	Tyr	Leu	Leu	His	Arg	Tyr	115	120	125	
Asp	Val	Ala	Tyr	Met	Lys	Leu	Leu	Gly	Ser	Gly	Val	Arg	Gln	Thr	Ile	130	135	140	
Asn	Tyr	Gly	His	Ile	Ser	Asp	Ser	Ile	Leu	Val	Ile	Pro	Pro	Leu	Ser	145	150	155	160
Glu	Gln	Gln	Lys	Ile	Ala	Gln	Phe	Leu	Asp	Asp	Lys	Thr	Ala	Lys	Ile	165	170	175	
Asp	Gln	Ala	Val	Asp	Leu	Ala	Glu	Lys	Gln	Ile	Ala	Leu	Leu	Lys	Glu	180	185	190	
His	Lys	Gln	Ile	Leu	Ile	Gln	Asn	Ala	Val	Thr	Arg	Gly	Leu	Asn	Pro	195	200	205	
Asp	Val	Pro	Leu	Lys	Asp	Ser	Gly	Val	Glu	Trp	Ile	Gly	Gln	Val	Pro	210	215	220	
Glu	His	Trp	Asp	Val	Gln	Arg	Ser	Lys	Phe	Ile	Phe	Lys	Lys	Ile	Glu	225	230	235	240
Arg	Lys	Val	Asn	Glu	Asp	Gln	Ile	Val	Thr	Cys	Phe	Arg	Asp	Gly		245	250	255	
Gln	Val	Thr	Leu	Arg	Ala	Asn	Arg	Arg	Thr	Glu	Gly	Phe	Thr	Asn	Ala	260	265	270	
Leu	Lys	Glu	His	Gly	Tyr	Gln	Gly	Ile	Arg	Lys	Gly	Asp	Leu	Val	Ile	275	280	285	
His	Ala	Met	Asp	Ala	Phe	Ala	Gly	Ala	Ile	Gly	Ile	Ser	Asp	Ser	Asp	290	295	300	
Gly	Lys	Ala	Thr	Pro	Val	Tyr	Ser	Val	Cys	Leu	Pro	His	Asp	Lys	Gln	305	310	315	320
Lys	Ile	Asp	Val	Tyr	Phe	Tyr	Ala	Tyr	Tyr	Leu	Arg	Asn	Leu	Ala	Leu	325	330	335	
Ser	Gly	Phe	Ile	Ser	Ser	Leu	Ala	Lys	Gly	Ile	Arg	Glu	Arg	Ser	Thr	340	345	350	
Asp	Phe	Arg	Tyr	Ser	Asp	Phe	Ala	Glu	Leu	Leu	Leu	Pro	Ile	Pro	Pro	355	360	365	
Tyr	Leu	Glu	Gln	Gln	Lys	Ile	Ala	Asp	Tyr	Leu	Asp	Lys	Gln	Thr	Ser	370	375	380	
Lys	Ile	Asp	Arg	Ala	Ile	Ala	Leu	Lys	Thr	Ala	His	Ile	Glu	Lys	Leu	385	390	395	400
Lys	Glu	Tyr	Lys	Ser	Val	Leu	Ile	Asn	Asp	Val	Val	Thr	Gly	Lys	Val	405	410	415	

Arg Val

<210> 25
<211> 3027
<212> DNA
<213> Haemophilus influenzae

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catcatgggtt ttaaactggc attttcacag gattttgatg cgcagtttgc catcgacaca 180
cgtctgtttt ggcaattcct gcaaaccagc caagaggcag aacttgcccg ttttcaacaa 240
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aatccgttta aaattgcatg tgcgttttca ggcagtaaaag tggttgacgg tgtcgaatac 1920
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<210> 26
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<212> PRT
<213> Haemophilus influenzae
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Pro	Lys	Ala	Glu	Tyr	Leu	Pro	Arg	His	His	Gly	Phe	Lys	Leu	Ala	Phe
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Ser	His	Lys	Asp	Phe	Glu	Gln	Lys	Tyr	Gln	Asn	Asn	Pro	Asp	Ile	His
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Thr	Arg	Glu	Leu	Ala	Phe	Gln	Ala	Ile	Leu	Arg	Asp	Val	Met	Ser	Glu
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Arg	His	Arg	Asp	Glu	Leu	Glu	Leu	Tyr	Lys	Leu	Phe	Ala	Lys	Asp	Ala
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<210> 27
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 <212> DNA
 <213> Haemophilus influenzae

<400> 27

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<210> 28

<211> 683

<212> PRT

<213> Haemophilus influenzae

<400> 28

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			165						170					175	
His	Asp	Tyr	Leu	Asp	Trp	Gly	Glu	Thr	Leu	Asp	Phe	Asp	Glu	Phe	Val
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Thr	Gln	Pro	Leu	Asn	Glu	Asn	Val	Leu	Leu	Lys	Ser	Cys	Thr	Glu	Val
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Arg	Leu	Asn	275	Tyr	Ser	Arg	Leu	Asp	280	Ala	Gln	Thr	Leu	Leu	285	Asn	Gly	Lys
Ala	Leu	Leu	290	Ile	Phe	Asp	Glu	Ile	295	Glu	Asp	Val	Phe	Asn	300	Gly	Ser	Phe
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Leu	Glu	Asn	325	Asn	Val	Pro	Met	Ile	330	Trp	Leu	Ser	Asn	Ser	335	Val	Ser	
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Pro	Asp	Leu	355	Pro	Leu	Lys	Asn	Lys	360	Ser	Ala	Leu	Ile	Thr	365	Gln	Leu	Thr
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Ser	Leu	Thr	385	Pro	Ala	Ile	Leu	Ser	390	Arg	Thr	Ile	Arg	Val	395	Ala	Lys	Glu
Leu	Asn	Thr	405	Ser	Asn	Phe	Ala	Glu	410	Thr	Leu	Leu	Met	Met	415	Phe	Asn	Gln
Thr	Leu	Lys	420	Ser	Gln	Asn	Lys	Pro	425	Lys	Ile	Glu	Pro	Leu	430	Val	Leu	Gly
Lys	Ala	Asp	435	Tyr	Asn	Leu	Asp	Tyr	440	Val	Ala	Cys	Asn	Asp	445	Asn	Ile	His
Arg	Ile	Ser	450	Glu	Gly	Leu	Lys	Arg	455	Ser	Lys	Lys	Gly	Arg	460	Ile	Cys	Cys
Tyr	Gly	Pro	465	Pro	Gly	Thr	Gly	Lys	470	Thr	Ala	Trp	Ala	Ala	475	Trp	Leu	Ala
Glu	Gln	Leu	485	Asp	Met	Pro	Leu	Leu	490	Arg	Gln	Gly	Ser	Asp	495	Leu	Leu	
Asn	Pro	Tyr	500	Val	Gly	Gly	Thr	Glu	505	Gln	Asn	Ile	Ala	Gln	510	Ala	Phe	Glu
Gln	Ala	Lys	515	Ala	Asp	Asn	Ala	Ile	520	Leu	Val	Leu	Asp	Glu	525	Val	Asp	Thr
Phe	Leu	Phe	530	Ser	Arg	Glu	Gly	Ala	535	Asn	Arg	Ser	Trp	Glu	540	Arg	Ser	Gln
Val	Asn	Glu	545	Met	Leu	Thr	Gln	Ile	550	Glu	Arg	Phe	Glu	Gly	555	Leu	Met	Val
Val	Ser	Thr	565	Asn	Leu	Ile	Glu	Val	570	Leu	Asp	His	Ala	Ala	575	Leu	Arg	Arg
Phe	Asp	Leu	580	Lys	Leu	Lys	Phe	Asp	585	Tyr	Leu	Thr	Leu	Lys	590	Gln	Arg	Leu
Asp	Phe	Ala	595	Lys	Gln	Gln	Ala	Glu	600	Ile	Leu	Gly	Leu	Pro	605	Leu	Leu	Ser
Glu	Glu	Asp	610	Leu	Ser	Gln	Ile	Glu	615	Ser	Leu	Asn	Leu	Leu	620	Thr	Pro	Gly
Asp	Phe	Ala	625	Ala	Val	Ala	Arg	Arg	630	His	Gln	Phe	Ser	Pro	635	Phe	His	Lys
Val	Gln	Asp	645	Trp	Leu	Met	Ala	Leu	650	Gln	Gly	Glu	Cys	Glu	655	Val	Lys	Pro
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<211> 975
 <212> DNA
 <213> Haemophilus influenzae

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 <211> 324
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 35 40 45
 His Lys Glu Cys Leu Asn Asn Gln Trp Asp Ser Cys Ile Glu Tyr Cys
 50 55 60
 Lys Thr Tyr Trp Ser Asp His Thr Gly Thr Val Ser Asn His Leu Arg
 65 70 75 80
 Gln Ile Gln Asp Phe Tyr Gln Leu Gly Glu Asp Thr Leu Trp Ile Thr
 85 90 95
 Phe Phe Gly Arg Lys Leu Tyr Trp Ala Phe Cys Ser Lys Glu Val Val
 100 105 110
 Glu Glu Ser Asp Gly Ser Arg Thr Arg Lys Val Ile Ser Asn Asn Gly
 115 120 125
 Asn Trp Ser Cys Val Asp Ala Asn Gly Lys Glu Leu Leu Val Asp Asn
 130 135 140
 Leu Asp Gly Arg Val Thr Lys Val Gln Ala Tyr Arg Gly Thr Ile Cys
 145 150 155 160
 Gly Val Glu Met Glu Asp Tyr Leu Ile Arg Arg Ile Asn Gly Glu Val
 165 170 175
 Ile Glu Glu Ile Thr Glu Ala Lys Glu Ala Tyr Glu Thr Leu Ile Lys
 180 185 190
 Ser Val Glu Lys Leu Ile Lys Gly Leu Trp Trp Ser Asp Phe Glu Leu
 195 200 205

Leu	Thr	Asp	Leu	Val	Phe	Ser	Lys	Leu	Gly	Trp	Gln	Arg	Tyr	Ser	Val
210						215					220				
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225					230					235					240
Thr	Gln	Lys	Arg	Val	Phe	Val	Gln	Ile	Lys	Ser	Asp	Thr	Asp	Ile	Lys
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Gln	Leu	Asp	Glu	Tyr	Val	Ser	Asn	Phe	Glu	Ser	Glu	Tyr	Lys	Asn	Tyr
			260					265					270		
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		275					280					285			
Asp	Glu	Lys	Gln	Tyr	Gln	Ala	Lys	Gly	Ile	Lys	Leu	Val	Asn	Gly	Arg
	290					295					300				
Lys	Met	Ala	Glu	Leu	Val	Ile	Ser	Ala	Gly	Leu	Val	Glu	Trp	Leu	Ile
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Glu Lys Arg Leu Glu Asn Arg Pro His Phe Ile Val Gly Val Ala Asp	
35 40 45	
Gly Ile Ser Asn Ser Asn Arg Pro Glu Lys Ala Ser Lys Leu Ala Met	
50 55 60	
Gln Leu Leu Ser Gln Met Glu Ser Ile Asn Arg Gln Thr Ile Tyr Asp	
65 70 75 80	
Leu Gln Ser Ser Leu Ser Ala Glu Leu Ala Glu Asp Tyr Phe Gly Ser	
85 90 95	

Ala	Thr	Thr	Phe	Val	Ala	Ala	Glu	Ile	Asp	Gln	Ile	Thr	Arg	Lys	Ala		
			100					105					110				
Lys	Ile	Leu	Ser	Val	Gly	Asp	Ser	Arg	Ala	Tyr	Leu	Ile	Asp	Ala	Gln		
		115					120					125					
Gly	Lys	Trp	Gln	Gln	Ile	Thr	Gln	Asp	His	Ser	Ile	Leu	Ser	Glu	Leu		
	130					135					140						
Leu	Thr	Asp	Phe	Pro	Asp	Lys	Lys	Glu	Glu	Asp	Phe	Ala	Thr	Ile	Tyr		
145					150					155					160		
Gly	Gly	Val	Ser	Ser	Cys	Leu	Val	Ala	Asp	Tyr	Ser	Glu	Phe	Gln	Asp		
			165						170					175			
Lys	Ile	Phe	Tyr	Gln	Glu	Ile	Glu	Ile	Gln	Gln	Gly	Glu	Ser	Leu	Leu		
		180						185					190				
Leu	Cys	Ser	Asp	Gly	Leu	Thr	Asp	Gly	Leu	Ser	Asp	Glu	Met	Arg	Glu		
	195						200					205					
Lys	Ile	Trp	Gln	Lys	Tyr	Pro	Asp	Asp	Lys	Tyr	Arg	Leu	Thr	Val	Cys		
210						215					220						
Arg	Lys	Met	Ile	Glu	Lys	Gln	Ser	Phe	Ser	Asp	Asp	Leu	Ser	Val	Val		
225					230					235					240		
Cys	Cys	His	Ser	Ile	Ile	Glu											
				245													

<210> 33
 <211> 816
 <212> DNA
 <213> Haemophilus influenzae

<400> 33																	
atgaaaaatg	atgtgaatta	tgcagtggaa	cttatccgca	aagcggatgg	cattttaatt											60	
acagctggtg	cgggtatgag	cgtggattct	gggcttcccg	atttccgcag	cgttggcgga											120	
ttttggaatg	cttatcctat	gtttaaagaa	cataatatat	cttttgaaga	gatcgcaacg											180	
ccactagctt	ataagcataa	tcaggaacta	gcctattggg	tttatgggca	tcgattagtt											240	
caataccgaa	atactcttcc	tcacgaaggg	tatcagattt	taaaatgctg	ggcggggagat											300	
aaacctcatg	gatattttgt	ttttaccagt	aatgttgatg	ggcattttca	aaaggctggt											360	
tttaatgata	gccatgttta	tgaagtacat	ggtactttgg	agcgtcttca	atgtgtcaat											420	
aattgtcgag	gattaagttg	gtctgcatca	agttttcaac	ctgtcgtgga	taatgaaaac											480	
ttatgtttta	ccagtgaata	accacatttg	ccttattgtg	ggggctttgc	tcgtcaaaat											540	
gtactaatgt	ttaatgattg	gagttatgca	agtcaatatc	aggattttta	aaaagtgcgg											600	
ttagaatcgt	ggttaaaaaga	agtgcaaaat	ctcgtcgtta	tcgaactggg	aacaggaaaa											660	
gccattccac	tgtgcgtcga	ttttctgaac	gtacggcgaa	aagcaaaaaa	aagggggggg											720	
ttatccgta	ttacccaca	agatgcaggg	cgtgcccgaa	aatgcacttt	tttaagtcta											780	
agaaatgaaa	gcgttagatg	cactaaaagc	gattga													816	

<210> 34
 <211> 271
 <212> PRT
 <213> Haemophilus influenzae

<400> 34																	
Met	Lys	Asn	Asp	Leu	Asn	Tyr	Ala	Val	Glu	Leu	Ile	Arg	Lys	Ala	Asp		
1				5					10					15			
Gly	Ile	Leu	Ile	Thr	Ala	Gly	Ala	Gly	Met	Ser	Val	Asp	Ser	Gly	Leu		
		20						25					30				
Pro	Asp	Phe	Arg	Ser	Val	Gly	Gly	Phe	Trp	Asn	Ala	Tyr	Pro	Met	Phe		
		35					40					45					
Lys	Glu	His	Asn	Ile	Ser	Phe	Glu	Glu	Ile	Ala	Thr	Pro	Leu	Ala	Tyr		

50	55	60
Lys His Asn Gln Glu Leu	Ala Tyr Trp Phe Tyr	Gly His Arg Leu Val
65	70	75
Gln Tyr Arg Asn Thr	Leu Pro His Glu Gly	Tyr Gln Ile Leu Lys Cys
85	90	95
Trp Ala Gly Asp Lys	Pro His Gly Tyr Phe	Val Phe Thr Ser Asn Val
100	105	110
Asp Gly His Phe Gln	Lys Ala Gly Phe Asn	Asp Ser His Val Tyr Glu
115	120	125
Val His Gly Thr Leu	Glu Arg Leu Gln Cys	Val Asn Asn Cys Arg Gly
130	135	140
Leu Ser Trp Ser Ala	Ser Ser Phe Gln Pro	Val Val Asp Asn Glu Asn
145	150	155
Leu Cys Leu Thr Ser	Glu Lys Pro His Leu	Pro Tyr Cys Gly Gly Phe
165	170	175
Ala Arg Gln Asn Val	Leu Met Phe Asn Asp	Trp Ser Tyr Ala Ser Gln
180	185	190
Tyr Gln Asp Phe Lys	Lys Val Arg Leu Glu	Ser Trp Leu Lys Glu Val
195	200	205
Gln Asn Leu Val Val	Ile Glu Leu Gly Thr	Gly Lys Ala Ile Pro Leu
210	215	220
Cys Val Asp Phe Leu	Asn Val Arg Arg Lys	Ala Lys Lys Arg Gly Gly
225	230	235
Leu Ser Arg Ile Thr	Pro Gln Asp Ala Gly	Arg Ala Arg Lys Cys Thr
245	250	255
Phe Leu Ser Leu Arg	Asn Glu Ser Val Arg	Cys Thr Lys Ser Asp
260	265	270

<210> 35
 <211> 273
 <212> DNA
 <213> Haemophilus influenzae

<400> 35	
tttctccata aagagaaatt ctttacttct tacatatatta taaagccttt aattaagaaa	60
aaggagcaaa taatggcaat gaaagtaatt atggcaagag atccactttt tgaggatgta	120
aaaaaatatg tgcaacaaca aaaatttgca tcttgctcaa tgattcaacg cagatttatg	180
ttgggtttta atcgagctgg gcaaatttta gaacagttgg aacaagcggg tattatttca	240
tcaatgaaaa atgggcagag aaaagtatta tga	273

<210> 36
 <211> 90
 <212> PRT
 <213> Haemophilus influenzae

<400> 36
Phe Leu His Lys Glu Lys Phe Phe Thr Ser Tyr Ile Phe Ile Lys Pro
1 5 10 15
Leu Ile Lys Lys Lys Glu Gln Ile Met Ala Met Lys Val Ile Met Ala
20 25 30
Arg Asp Pro Leu Phe Glu Asp Val Lys Lys Tyr Val Gln Gln Lys
35 40 45
Phe Ala Ser Cys Ser Met Ile Gln Arg Arg Phe Met Leu Gly Phe Asn
50 55 60
Arg Ala Gly Gln Ile Leu Glu Gln Leu Glu Gln Ala Gly Ile Ile Ser

Tyr	Val	Leu	Ser	Thr	Ala	Pro	Trp	His	Asn	Pro	Phe	Ala	Trp	Ser	Ile
65					70					75					80
Lys	Val	Lys	Trp	Ile	His	His	Tyr	Phe	Gly	Glu	Glu	Lys	Gly	Ser	Ala
				85					90					95	
Leu	Tyr	Lys	Arg	Leu	Ile	Leu	Ser	His	His	Lys	Asn	Leu	Asn	Gln	Gly
			100					105					110		
Asp	Tyr	Leu	Ile	Asp	Asp	Arg	Thr	Lys	Asn	Gly	Ala	Gly	Lys	Phe	Gln
		115					120					125			
Gly	Glu	His	Val	His	Phe	Gly	Thr	Glu	Gln	Phe	Ala	Asn	Lys	Arg	Ser
	130					135					140				
Leu	Lys	Asn	Asp	Arg	Glu	Lys									
145					150										

<210> 43
 <211> 441
 <212> DNA
 <213> Haemophilus influenzae

<400> 43	
cattatcgga gtattcacgg taaagaacat aaggcacagg tcaagccctt ggcttttggtt	60
caacaaggac caagtagcta tttagtcgca caatatgaga atggcgatat ttacacacctt	120
gctttgcatc gcttgcttaa ggtaacagtg agtacaatga tatttgaacg ccctgatttt	180
aatttgaaat cttatgtaga aagccaaaag tttggtttta cctatgggtcg aaaaattcga	240
ttaactttcc gcattaataa agatattggt ggatttttaa cagaaacacc attatcaatg	300
gatcaaacag taaaagattg tggcactgaa tatgaaattt ccgctaccgt gattaagagc	360
gctatgctgg aatgggtggat agcccathtt ggtgaagatt accaagaaat tgaccgcact	420
tatttagacg aaaatgccta a	441

<210> 44
 <211> 146
 <212> PRT
 <213> Haemophilus influenzae

<400> 44	
His Tyr Arg Ser Ile His Gly Lys Glu His Lys Ala Gln Val Lys Pro	
1 5 10 15	
Leu Ala Leu Val Gln Gln Gly Pro Ser Ser Tyr Leu Val Ala Gln Tyr	
20 25 30	
Glu Asn Gly Asp Ile Leu His Leu Ala Leu His Arg Leu Leu Lys Val	
35 40 45	
Thr Val Ser Thr Met Ile Phe Glu Arg Pro Asp Phe Asn Leu Lys Ser	
50 55 60	
Tyr Val Glu Ser Gln Lys Phe Gly Phe Thr Tyr Gly Arg Lys Ile Arg	
65 70 75 80	
Leu Thr Phe Arg Ile Asn Lys Asp Ile Gly Gly Phe Leu Thr Glu Thr	
85 90 95	
Pro Leu Ser Met Asp Gln Thr Val Lys Asp Cys Gly Thr Glu Tyr Glu	
100 105 110	
Ile Ser Ala Thr Val Ile Lys Ser Ala Met Leu Glu Trp Trp Ile Ala	
115 120 125	
His Phe Gly Glu Asp Tyr Gln Glu Ile Asp Arg Thr Tyr Leu Asp Glu	
130 135 140	
Asn Ala	
145	

<210> 45
 <211> 642
 <212> DNA
 <213> Haemophilus influenzae

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<400> 45
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catattgata atatcatcag aagtgtttat acgaatccaa tcttaagtat tgaattgtgc      120
aaatctgtaa cagaaggat ttgcaaaaca attctcaatg ataaaggaga aagtattcct      180
gaaaaatatc cgaatcttgt atctacaaca attaaaaaat tagatctgaa ttatcatcaa      240
gattaccaat atttgcttga attagctaaa agtctgggtt caattcttca ttatgttgca      300
aaaattagaa atgaatatgg tagttatgct tctcacggtc aagatattga acataagcaa      360
gtaagtagcg atcttgcttt atttgtactt cattcaacca atgcaatttt aggatttatt      420
ctacactttt acattgctac aaacgattat cgaaaaagtg aacgaatacg atatgaagat      480
tatgaaagaa tcaatgaatt aattgatgaa gaatatgaaa gggaagtaat atataaaatt      540
tcatattcac gggcattatt tgatcaagat ctagaagctt ataaagagtt agtacttaca      600
tttaacaaaa cagaacatga gagtctgatg gatacgctct ga      642
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<210> 46
 <211> 213
 <212> PRT
 <213> Haemophilus influenzae

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<400> 46
Met Met Asn Trp Val Leu Gly Ser Met Glu Lys Ala Pro Ser Phe Gln
 1          5          10          15
His Tyr His Gly His Ile Asp Asn Ile Ile Arg Ser Val Tyr Thr Asn
 20          25          30
Pro Ile Leu Ser Ile Glu Leu Cys Lys Ser Val Thr Glu Gly Ile Cys
 35          40          45
Lys Thr Ile Leu Asn Asp Lys Gly Glu Ser Ile Pro Glu Lys Tyr Pro
 50          55          60
Asn Leu Val Ser Thr Thr Ile Lys Lys Leu Asp Leu Asn Tyr His Gln
 65          70          75          80
Asp Tyr Gln Tyr Leu Leu Glu Leu Ala Lys Ser Leu Gly Ser Ile Leu
 85          90          95
His Tyr Val Ala Lys Ile Arg Asn Glu Tyr Gly Ser Tyr Ala Ser His
100          105          110
Gly Gln Asp Ile Glu His Lys Gln Val Ser Ser Asp Leu Ala Leu Phe
115          120          125
Val Leu His Ser Thr Asn Ala Ile Leu Gly Phe Ile Leu His Phe Tyr
130          135          140
Ile Ala Thr Asn Asp Tyr Arg Lys Ser Glu Arg Ile Arg Tyr Glu Asp
145          150          155          160
Tyr Glu Arg Ile Asn Glu Leu Ile Asp Glu Glu Tyr Glu Arg Glu Val
165          170          175
Ile Tyr Lys Ile Ser Tyr Ser Arg Ala Leu Phe Asp Gln Asp Leu Glu
180          185          190
Ala Tyr Lys Glu Leu Val Leu Thr Phe Lys Gln Thr Glu His Glu Ser
195          200          205
Leu Met Asp Thr Leu
210
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<210> 47
 <211> 1344

<212> DNA
 <213> Haemophilus influenzae

<400> 47
 atgaatgatt ggaagggttat aacttttagct gattgctgctt catttcaaga aggttatggt 60
 aatccatcaa aaaatgaacc aagctacttt ggaggaacaa ttaaattggtt gagagcaaca 120
 gatttaaaca atggtttttgt atataaaacc tctcaaactt taacagaaaa aggattttta 180
 agtgcaaaaga agagtgtctgt attattttgaa ccagatagtt tagcaattag caaatcagga 240
 actattggac gaattggaat cttaaaaagat tacatgtgtg gaaatagagc tgaattaat 300
 atcaaagtta atgaaaatat ttgtaaccca ttattttatt ttataccctt attaaatagc 360
 aaagaacaaa ttgaaacttt agctgaaggt agtggtccaaa aaaatctata tgtatcagct 420
 ttaagtaaag ttaaattatt acttctagat ataaataagc aaaaggaaat tggatatatt 480
 ctaaatactt tagatcaaaa aatagaactc aacactcaaa tcaaccaaac cttagaacia 540
 atcgcccaag ccctgtttta aagctggttt gtcgatttcg atcccgtgctg tgccaaaatc 600
 caagcccttt cagacggtct tagccttgaa caagcagaac ttgccgccat gcaggcaatc 660
 agcggaaaaa caccgaaga actgaccgca ctttcacaaa cacagcctga ccgctacgcc 720
 gaactagccg aaaccgcca agcgtttccg tgtgagatgg tggaggttga tggggttgaa 780
 gtgccgaagg ggtgggaatt atctacgatt ggcgattgtt atgatgtcgt tatggggcaa 840
 tctccaaaag gagaaactta taatgaaaac aaacaaggga tgcttttcta tcaaggctcg 900
 gcagaatttg gttggcgctt tctacccca agattattta caacagatcc taaacgtatt 960
 gcagaacaaa attctatttt aatgagcgtt cgagctcctg ttggggacat taatatagca 1020
 ctgaaaaaat gctgtattgg tcgcggatta gctgcattac aacataagag taaaagtttg 1080
 tcgttcggtt tatatcaaat acaatctata aaaccagaat tagatttatt taatggtgaa 1140
 ggaactgttt ttggttctat caatcaggat aacttaaaaa atatccaat tattaaccct 1200
 gatgaaaaat ttattcagct ttttgaaaaa tatttatcat cttgtgattc aaaaattatg 1260
 aataacgaga tagaaaataa tgcactgaaa gaaataaggg atttattgtt acctagatta 1320
 ttgagtggag aaattcaatt atga 1344

<210> 48
 <211> 447
 <212> PRT
 <213> Haemophilus influenzae

<400> 48
 Met Asn Asp Trp Lys Val Ile Thr Leu Ala Asp Cys Ala Ser Phe Gln
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 Glu Gly Tyr Val Asn Pro Ser Lys Asn Glu Pro Ser Tyr Phe Gly Gly
 20 25 30
 Thr Ile Lys Trp Leu Arg Ala Thr Asp Leu Asn Asn Gly Phe Val Tyr
 35 40 45
 Lys Thr Ser Gln Thr Leu Thr Glu Lys Gly Phe Leu Ser Ala Lys Lys
 50 55 60
 Ser Ala Val Leu Phe Glu Pro Asp Ser Leu Ala Ile Ser Lys Ser Gly
 65 70 75 80
 Thr Ile Gly Arg Ile Gly Ile Leu Lys Asp Tyr Met Cys Gly Asn Arg
 85 90 95
 Ala Val Ile Asn Ile Lys Val Asn Glu Asn Ile Cys Asn Pro Leu Phe
 100 105 110
 Ile Phe Tyr Thr Leu Leu Asn Ser Lys Glu Gln Ile Glu Thr Leu Ala
 115 120 125
 Glu Gly Ser Val Gln Lys Asn Leu Tyr Val Ser Ala Leu Ser Lys Val
 130 135 140
 Lys Leu Leu Leu Leu Asp Ile Asn Lys Gln Lys Glu Ile Gly Tyr Ile
 145 150 155 160
 Leu Asn Thr Leu Asp Gln Lys Ile Glu Leu Asn Thr Gln Ile Asn Gln

cgttggtcta	atgcatattg	gaatatcatt	aagccaacaa	taaaaaatat	tcgagatatt	840
aagcgttaca	catcttctct	atcgaatatc	tttaaacaat	taggtaaaga	aattgatgtg	900
gttgatttac	tcactattga	agcgataaga	atcttctttc	cagataaatt	taaagaaatt	960
tttgaactta	aagattatct	cttggcacga	tcagataatg	acaaaagaaa	agttaagtta	1020
agtgatttta	ttcaagataa	tgaaatgtat	gagtcctttc	tagaagtttt	atttgatatt	1080
gataatataa	attcaaataa	tgaattccta	aaaaatagaa	ggattgctta	ttcggcattc	1140
tttgatttat	atcttgaaca	agttatgagt	cctgagttca	taaatgttaa	attatcacaa	1200
aaagtttggc	ttgcaatgca	gtcagaagaa	gattttcaaga	tcgctttatc	agctgttcct	1260
gacgattctc	tagaaaatgt	agttaacaat	ttaattgact	atgaaaaaga	ctttactaaa	1320
gaaatagctc	tagcaactat	accaacatta	tatagaaatt	taccaagagt	gcctgaaaaa	1380
gaattaggat	tccttgactt	tggggcggat	atgggttggg	gtcgccttagt	ttatagatta	1440
cttagaagac	ttcctgagaa	ggataaaaaa	gaagttatta	ctcaactatt	aaattctagc	1500
gatctatatg	ggcaatatca	aattgttaga	attattggat	atcgagaggg	ccgagggtcat	1560
caattagtat	ctgaatcgga	tgcaaaaagac	ttggaggaaa	tattttttaa	taatattcgc	1620
tctgcaacaa	ttaaagaact	tgcaggaacc	tataatttgt	cacatataat	ctatttcttt	1680
gtttcaattg	gaaacccttt	ttctgatgat	atattaagtt	cccctgaagt	atttttatca	1740
ttactttaa	cttcaatata	agaacgtaaa	tctcaaagag	gggatgatcc	tacaatacat	1800
agagagaaaa	ttctactttg	ggatgcctta	attaaaaatt	gtggagatga	ggataaagta	1860
aatagtttaa	ttgaaaaaat	agctgaagat	gaagaactta	gaaataaaga	ttatatggaa	1920
cttgcaatta	aatataagaa	tggataccga	cataaaaaat	caatgaatca	tgaagatgat	1980
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<210> 50

<211> 664

<212> PRT

<213> Haemophilus influenzae

<400> 50

Met	Glu	Leu	Ile	Ser	Asp	Asn	Pro	Ile	Lys	Asp	Ser	Ser	Asn	Asp	Leu
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Leu	Gly	Arg	Ala	Ser	Ser	Ala	Glu	Ala	Phe	Ala	Lys	His	Ile	Phe	Ser
			20					25					30		
Phe	Asp	Tyr	Lys	Glu	Gly	Leu	Val	Gly	Leu	Cys	Gly	Glu	Trp	Gly	
		35				40					45				
Asn	Gly	Lys	Thr	Ser	Tyr	Ile	Asn	Leu	Met	Arg	Pro	Glu	Leu	Glu	Lys
	50					55				60					
Asn	Ser	Phe	Val	Leu	Asp	Phe	Asn	Pro	Trp	Met	Phe	Ser	Asp	Ala	His
	65				70				75					80	
Asn	Leu	Val	Ala	Leu	Phe	Phe	Thr	Glu	Ile	Ser	Ala	Gln	Leu	Arg	Asp
			85					90					95		
Tyr	Glu	Asp	Asp	Asn	Glu	Leu	Ile	Asp	Ser	Leu	Ser	Ser	Phe	Gly	Glu
		100						105					110		
Leu	Leu	Ser	Asn	Leu	Lys	Pro	Ile	Pro	Phe	Val	Gly	Asn	Tyr	Phe	Ser
		115				120						125			
Val	Leu	Gly	Gly	Cys	Leu	Ser	Phe	Phe	Ser	Lys	Lys	Lys	Lys	Glu	Lys
	130					135					140				
Asn	Ser	Leu	Lys	Asn	Gln	Arg	Asp	Lys	Leu	Ile	Lys	Val	Leu	Lys	Glu
	145				150				155					160	
Ile	Ser	Lys	Pro	Ile	Thr	Val	Ile	Leu	Asp	Asp	Ile	Asp	Arg	Leu	Ser
			165					170					175		
Ser	Asp	Glu	Leu	Gln	Ser	Ile	Leu	Lys	Leu	Val	Arg	Val	Thr	Gly	Asn
		180						185					190		
Phe	Pro	Asn	Ile	Val	Tyr	Val	Leu	Ser	Phe	Asp	Lys	Asn	Arg	Val	Ile
		195				200					205				
Lys	Pro	Leu	Asn	Asp	Asn	Thr	Ile	Asp	Gly	Gln	Asp	Tyr	Leu	Glu	Lys

210	215	220
Ile Ile Gln Ile Pro Phe Asp Ile Pro Gln Val Pro Lys Lys Leu Leu		
225	230	235
Gln Glu Asn Leu Phe Ser Ser Leu Asp Lys Ile Leu Arg Asp Val Tyr		
	245	250
Leu Asp Lys Ala Arg Trp Ser Asn Ala Tyr Trp Asn Ile Ile Lys Pro		
	260	265
Thr Ile Lys Asn Ile Arg Asp Ile Lys Arg Tyr Thr Ser Ser Leu Ser		
	275	280
Asn Ile Phe Lys Gln Leu Gly Lys Glu Ile Asp Val Val Asp Leu Leu		
	290	295
Thr Ile Glu Ala Ile Arg Ile Phe Phe Pro Asp Lys Phe Lys Glu Ile		
305	310	315
Phe Glu Leu Lys Asp Tyr Leu Leu Ala Arg Ser Asp Asn Asp Lys Arg		
	325	330
Lys Val Lys Leu Ser Asp Phe Ile Gln Asp Asn Glu Met Tyr Glu Ser		
	340	345
Phe Leu Glu Val Leu Phe Asp Ile Asp Asn Ile Asn Ser Asn Asn Glu		
	355	360
Phe Leu Lys Asn Arg Arg Ile Ala Tyr Ser Ala Phe Phe Asp Leu Tyr		
370	375	380
Phe Glu Gln Val Met Ser Pro Glu Phe Ile Asn Val Lys Leu Ser Gln		
385	390	395
Lys Val Trp Leu Ala Met Gln Ser Glu Glu Asp Phe Lys Ile Ala Leu		
	405	410
Ser Ala Val Pro Asp Asp Ser Leu Glu Asn Val Val Asn Asn Leu Ile		
	420	425
Asp Tyr Glu Lys Asp Phe Thr Lys Glu Ile Ala Leu Ala Thr Ile Pro		
	435	440
Thr Leu Tyr Arg Asn Leu Pro Arg Val Pro Glu Lys Glu Leu Gly Phe		
	450	455
Phe Asp Phe Gly Ala Asp Met Val Trp Ser Arg Leu Val Tyr Arg Leu		
465	470	475
Leu Arg Arg Leu Pro Glu Lys Asp Lys Lys Glu Val Ile Thr Gln Leu		
	485	490
Leu Asn Ser Ser Asp Leu Tyr Gly Gln Tyr Gln Ile Val Gly Ile Ile		
	500	505
Gly Tyr Arg Glu Gly Arg Gly His Gln Leu Val Ser Glu Ser Asp Ala		
	515	520
Lys Asp Leu Glu Glu Ile Phe Leu Asn Asn Ile Arg Ser Ala Thr Ile		
	530	535
Lys Glu Leu Ala Gly Thr Tyr Asn Leu Ser His Ile Ile Tyr Phe Phe		
545	550	555
Val Ser Ile Gly Asn Pro Phe Ser Asp Asp Ile Leu Ser Ser Pro Glu		
	565	570
Val Phe Leu Ser Leu Leu Lys Ser Ser Ile Ser Glu Arg Lys Ser Gln		
	580	585
Arg Gly Asp Asp Pro Thr Ile His Arg Glu Lys Ile Leu Leu Trp Asp		
	595	600
Ala Leu Ile Lys Ile Cys Gly Asp Glu Asp Lys Val Asn Ser Leu Ile		
	610	615
Glu Lys Ile Ala Glu Asp Glu Glu Leu Arg Asn Lys Asp Tyr Met Glu		
625	630	635
Leu Ala Ile Lys Tyr Lys Asn Gly Tyr Arg His Lys Lys Ser Met Asn		
	645	650
		655

His Glu Asp Asp Leu Asp Glu Phe
660

<210> 51
<211> 1155
<212> DNA
<213> Haemophilus influenzae

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ctaatttacg cctttaatgg aagtggaaaa acccgtttat caaaagtctt taagaatctt    120
attgcaccta aagaaaatca tgacaatgaa gaagatctaa cacgaagaaa aattctttat    180
ttcaatgcct ttaccgaaga tttattctat tgggataatg atctacttaa tgacacagaa    240
ccaaaattaa agattcaacc aaattctttt attcgctggg tgattagaga tcaaggggat    300
gaaggtaaag taattggaaa atttcatcat tattgtgatg aaaaacttat gcctaaat    360
gatatagaaa ataatacaat tacattcagt ttgacacgtg gagatgatac gcctgaagaa    420
aatataaaac tatcgaaggg ggaagaaagt aattttat    ggagtatttt tcatacgtta    480
attgaacaag ttgttgacaga attaaatatc tcagagccta gtgaacgcac tactaatgaa    540
tttgatgaac ttaaataatat ctttattgat gatccagtaa gttcattgga tgaaaatcat    600
cttattcaat tagctgttga tttagcagaa ttagtcaaag atagtcccgga tactataaaa    660
tttattatca ccacacacaa tcctttat    tataacgttt tataacaatga acttggagca    720
aaaaatgggt atattctaag aaaagatgaa aataagaatg aaaaagaaag atttgatctt    780
gaggtgaaac aagggtggttc aaacaagagt ttctcctatc atctttttct aaaaaatcta    840
cttgaagaag ttgaacctaa agatattcaa aaatatcact tcatgttact gagaaattta    900
tatgaaaaag ctgctaactt tcttggttat tcaggatggg caaatctatt acccaatgat    960
gatgcaagac aaagctatta cactcgtata atcaatttta ctagtcactc tacgttatca   1020
aatgagataa tcgctgagcc aacagatgcc gaaaagaaga ttgttaaata tttacttgaa   1080
catctaatta ataattatgg tttctatata gaagaaaata ttaaagaccc acaaactgat   1140
aatataacag agtaa                                     1155
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<210> 52
<211> 384
<212> PRT
<213> Haemophilus influenzae

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<400> 52
Tyr Asp Lys Ser Leu Asp Lys Ile Ala Lys Gln Leu Arg Asp Ser Asp
 1          5          10          15
Lys Lys Val Asn Leu Ile Tyr Ala Phe Asn Gly Ser Gly Lys Thr Arg
 20          25          30
Leu Ser Lys Val Phe Lys Asn Leu Ile Ala Pro Lys Glu Asn His Asp
 35          40          45
Asn Glu Glu Asp Leu Thr Arg Arg Lys Ile Leu Tyr Phe Asn Ala Phe
 50          55          60
Thr Glu Asp Leu Phe Tyr Trp Asp Asn Asp Leu Leu Asn Asp Thr Glu
 65          70          75          80
Pro Lys Leu Lys Ile Gln Pro Asn Ser Phe Ile Arg Trp Leu Ile Arg
 85          90          95
Asp Gln Gly Asp Glu Gly Lys Val Ile Gly Lys Phe His His Tyr Cys
100          105          110
Asp Glu Lys Leu Met Pro Lys Phe Asp Ile Glu Asn Asn Gln Ile Thr
115          120          125
Phe Ser Phe Ala Arg Gly Asp Asp Thr Pro Glu Glu Asn Ile Lys Leu
130          135          140
Ser Lys Gly Glu Glu Ser Asn Phe Ile Trp Ser Ile Phe His Thr Leu
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145					150					155					160
Ile	Glu	Gln	Val	Val	Ala	Glu	Leu	Asn	Ile	Ser	Glu	Pro	Ser	Glu	Arg
				165					170					175	
Thr	Thr	Asn	Glu	Phe	Asp	Glu	Leu	Lys	Tyr	Ile	Phe	Ile	Asp	Asp	Pro
			180					185					190		
Val	Ser	Ser	Leu	Asp	Glu	Asn	His	Leu	Ile	Gln	Leu	Ala	Val	Asp	Leu
		195				200					205				
Ala	Glu	Leu	Val	Lys	Asp	Ser	Pro	Asp	Thr	Ile	Lys	Phe	Ile	Ile	Thr
	210				215					220					
Thr	His	Asn	Pro	Leu	Phe	Tyr	Asn	Val	Leu	Tyr	Asn	Glu	Leu	Gly	Ala
	225			230					235					240	
Lys	Asn	Gly	Tyr	Ile	Leu	Arg	Lys	Asp	Glu	Asn	Lys	Asn	Glu	Lys	Glu
			245					250					255		
Arg	Phe	Asp	Leu	Glu	Val	Lys	Gln	Gly	Gly	Ser	Asn	Lys	Ser	Phe	Ser
		260						265				270			
Tyr	His	Leu	Phe	Leu	Lys	Asn	Leu	Leu	Glu	Glu	Val	Glu	Pro	Lys	Asp
		275				280					285				
Ile	Gln	Lys	Tyr	His	Phe	Met	Leu	Leu	Arg	Asn	Leu	Tyr	Glu	Lys	Ala
	290				295					300					
Ala	Asn	Phe	Leu	Gly	Tyr	Ser	Gly	Trp	Ser	Asn	Leu	Leu	Pro	Asn	Asp
	305				310					315				320	
Asp	Ala	Arg	Gln	Ser	Tyr	Tyr	Thr	Arg	Ile	Ile	Asn	Phe	Thr	Ser	His
			325					330					335		
Ser	Thr	Leu	Ser	Asn	Glu	Ile	Ile	Ala	Glu	Pro	Thr	Asp	Ala	Glu	Lys
		340					345					350			
Lys	Ile	Val	Lys	Tyr	Leu	Leu	Glu	His	Leu	Ile	Asn	Asn	Tyr	Gly	Phe
	355				360					365					
Tyr	Ile	Glu	Glu	Asn	Ile	Lys	Asp	Pro	Gln	Thr	Asp	Asn	Ile	Thr	Glu
	370				375					380					

<210> 53

<211> 999

<212> DNA

<213> Haemophilus influenzae

<400> 53

atgaacgact	taatcatcta	caacactgac	gatggtaa	atctcacgttgc	tttattagtt	60
atcgaaaatg	aggcttggct	gactcaaaa	cagcttgcgg	aactttttga	cacctctgta	120
ccaaatataa	ccactcatat	aaaaaacata	ttacaagaca	aagagttaga	tgagttttca	180
gttattaagg	attactta	aactgcccaa	gatagcaa	aatatcaagt	aaaacattat	240
tcccttgata	tgattctcgc	catcggcttt	cgtgtgcgca	gccctcgtgg	tgtacagttt	300
cgctcgttggg	cgaatacgca	attacgtact	tatttagata	aagggttttct	attagataaa	360
gagcgggttg	aaaatcctca	aggctcgattt	gatcattttg	atgaattact	ggaacaaatt	420
cgcgaaattc	gagccagtga	attgcggttt	tatcaaaaag	tacgagagtt	atttaaatta	480
tccagtgact	acgataaaac	agataaaagtc	actcaaatgt	tttttgcaga	aacacaaaat	540
aagttgattt	atgccattac	acaacaaacc	gccgcagagc	ttatttgtac	gcgtgcaaat	600
gccaaattgc	ctaatatggg	tcttacctct	tggaaaagg	ctgttgtacg	taaaggcgat	660
attattaccg	ctaaaaacta	tttaactcat	gatgaattag	attctttgaa	tcgttttagtg	720
atgatctttt	tagaaagtgc	tgaattacgc	gttaaaaatc	gtcaagatct	cacattaaat	780
ttctggcgta	ataatgtcga	taatttaatt	gaatttaacg	gttttccggt	gcttatcggt	840
aatggaaccc	gaaccgtaaa	acaaatggaa	acctttacca	aagaacaata	tgctttattt	900
gatcaggtca	gaaaacaaca	aaaacgcata	caagctgata	atgaagattt	agaaatttta	960
gaaaactggc	agaaagatct	gaaaaagcaa	aagcatttaa			999

<210> 54

<211> 332
 <212> PRT
 <213> Haemophilus influenzae

<400> 54
 Met Asn Asp Leu Ile Ile Tyr Asn Thr Asp Asp Gly Lys Ser His Val
 1 5 10 15
 Ala Leu Leu Val Ile Glu Asn Glu Ala Trp Leu Thr Gln Asn Gln Leu
 20 25 30
 Ala Glu Leu Phe Asp Thr Ser Val Pro Asn Ile Thr Thr His Ile Lys
 35 40 45
 Asn Ile Leu Gln Asp Lys Glu Leu Asp Glu Phe Ser Val Ile Lys Asp
 50 55 60
 Tyr Leu Ile Thr Ala Gln Asp Ser Lys Gln Tyr Gln Val Lys His Tyr
 65 70 75 80
 Ser Leu Asp Met Ile Leu Ala Ile Gly Phe Arg Val Arg Ser Pro Arg
 85 90 95
 Gly Val Gln Phe Arg Arg Trp Ala Asn Thr Gln Leu Arg Thr Tyr Leu
 100 105 110
 Asp Lys Gly Phe Leu Leu Asp Lys Glu Arg Leu Lys Asn Pro Gln Gly
 115 120 125
 Arg Phe Asp His Phe Asp Glu Leu Leu Glu Gln Ile Arg Glu Ile Arg
 130 135 140
 Ala Ser Glu Leu Arg Phe Tyr Gln Lys Val Arg Glu Leu Phe Lys Leu
 145 150 155 160
 Ser Ser Asp Tyr Asp Lys Thr Asp Lys Val Thr Gln Met Phe Phe Ala
 165 170 175
 Glu Thr Gln Asn Lys Leu Ile Tyr Ala Ile Thr Gln Gln Thr Ala Ala
 180 185 190
 Glu Leu Ile Cys Thr Arg Ala Asn Ala Lys Leu Pro Asn Met Gly Leu
 195 200 205
 Thr Ser Trp Lys Gly Ala Val Val Arg Lys Gly Asp Ile Ile Thr Ala
 210 215 220
 Lys Asn Tyr Leu Thr His Asp Glu Leu Asp Ser Leu Asn Arg Leu Val
 225 230 235 240
 Met Ile Phe Leu Glu Ser Ala Glu Leu Arg Val Lys Asn Arg Gln Asp
 245 250 255
 Leu Thr Leu Asn Phe Trp Arg Asn Asn Val Asp Asn Leu Ile Glu Phe
 260 265 270
 Asn Gly Phe Pro Leu Leu Ile Gly Asn Gly Thr Arg Thr Val Lys Gln
 275 280 285
 Met Glu Thr Phe Thr Lys Glu Gln Tyr Ala Leu Phe Asp Gln Val Arg
 290 295 300
 Lys Gln Gln Lys Arg Ile Gln Ala Asp Asn Glu Asp Leu Glu Ile Leu
 305 310 315 320
 Glu Asn Trp Gln Lys Asp Leu Lys Lys Gln Lys His
 325 330

<210> 55
 <211> 819
 <212> DNA
 <213> Haemophilus influenzae

<400> 55
 atgcaacagc gtgtactttt tttaaaagcg tggctaagcc aacgttatac taaaactgaa

60

ctgtgtcagc	agtttaatat	tagccgtcca	acggcagata	aatggattaa	acgccacgaa	120
cagcttggtt	ttgagggctt	aagcgagtta	tctcgtaa	attatcatag	ccctaatagcc	180
acgccacaat	ggatttgtga	ctggcttata	agtgagaaac	ttaaactgcc	tactgggggt	240
gccaaaaagc	ttttagataa	ctttactcgg	cattttccag	aagcgaaaaa	gccgtctgat	300
agcacgggcg	atttaatttt	ggcgtgtgca	gggttaaaac	gtcgtatgag	tgcagacaca	360
caatcttttg	gcgaatgcat	cgcacccaat	accacctgga	gtgctgactt	caaggggcaa	420
tttttactcg	gcaatcagaa	gttctgctat	ccgctgacga	ttacagataa	tttcagtcgc	480
tttttatttt	gttgtaaggg	gttgccgaat	acaaaatcag	cgctgttat	tgctgagttt	540
gaacgtcttt	ttgagcaatt	tggctgccc	tattcgattc	gtaccgataa	cgattcatct	600
tttgcatac	aagcattagg	tggatctagg	tgtattgact	taggtattcc	ttctgaacga	660
attaagccat	cacacccaga	gcagaacgga	cgacacgagc	gaatgcaccg	tagcttaaaa	720
acagcgcttc	aacctcaaaa	tagctttgaa	gctcaacaga	cattcttcaa	ccaattctta	780
cgagaataca	aagaagaatg	ttcacacgaa	ggcgtttga			819

<210> 56
 <211> 272
 <212> PRT
 <213> Haemophilus influenzae

<400> 56

Met	Gln	Gln	Arg	Val	Leu	Phe	Leu	Lys	Ala	Trp	Leu	Ser	Gln	Arg	Tyr
1				5					10					15	
Thr	Lys	Thr	Glu	Leu	Cys	Gln	Gln	Phe	Asn	Ile	Ser	Arg	Pro	Thr	Ala
			20					25					30		
Asp	Lys	Trp	Ile	Lys	Arg	His	Glu	Gln	Leu	Gly	Phe	Glu	Gly	Leu	Ser
		35				40					45				
Glu	Leu	Ser	Arg	Lys	Ser	Tyr	His	Ser	Pro	Asn	Ala	Thr	Pro	Gln	Trp
	50				55					60					
Ile	Cys	Asp	Trp	Leu	Ile	Ser	Glu	Lys	Leu	Lys	Arg	Pro	His	Trp	Gly
65				70				75						80	
Ala	Lys	Lys	Leu	Leu	Asp	Asn	Phe	Thr	Arg	His	Phe	Pro	Glu	Ala	Lys
			85					90					95		
Lys	Pro	Ser	Asp	Ser	Thr	Gly	Asp	Leu	Ile	Leu	Ala	Cys	Ala	Gly	Leu
			100					105					110		
Lys	Arg	Arg	Met	Ser	Ala	Asp	Thr	Gln	Ser	Phe	Gly	Glu	Cys	Ile	Ala
		115				120						125			
Pro	Asn	Thr	Thr	Trp	Ser	Ala	Asp	Phe	Lys	Gly	Gln	Phe	Leu	Leu	Gly
	130				135						140				
Asn	Gln	Lys	Phe	Cys	Tyr	Pro	Leu	Thr	Ile	Thr	Asp	Asn	Phe	Ser	Arg
145				150					155					160	
Phe	Leu	Phe	Cys	Cys	Lys	Gly	Leu	Pro	Asn	Thr	Lys	Ser	Ala	Pro	Val
			165					170					175		
Ile	Ala	Glu	Phe	Glu	Arg	Leu	Phe	Glu	Gln	Phe	Gly	Leu	Pro	Tyr	Ser
		180					185					190			
Ile	Arg	Thr	Asp	Asn	Asp	Ser	Ser	Phe	Ala	Ser	Gln	Ala	Leu	Gly	Gly
	195				200							205			
Ser	Arg	Cys	Ile	Asp	Leu	Gly	Ile	Pro	Ser	Glu	Arg	Ile	Lys	Pro	Ser
	210				215						220				
His	Pro	Glu	Gln	Asn	Gly	Arg	His	Glu	Arg	Met	His	Arg	Ser	Leu	Lys
225				230				235						240	
Thr	Ala	Leu	Gln	Pro	Gln	Asn	Ser	Phe	Glu	Ala	Gln	Gln	Thr	Phe	Phe
			245					250					255		
Asn	Gln	Phe	Leu	Arg	Glu	Tyr	Lys	Glu	Glu	Cys	Ser	His	Glu	Gly	Val
			260					265					270		

<210> 57
 <211> 333
 <212> DNA
 <213> Haemophilus influenzae

<400> 57
 tgccaaacgg cgaacaaatc cgcagaatta agcagcgttg tggctattct cgcttcatgt 60
 ttaatcgggt taacttggca gaatgaacaa tataagcaag ataatggcgt caagttcagt 120
 tatacgaaaa tcgccaaatt gcaccacaaa gtcaccaata cccacaaaaa aaactacttg 180
 catcaaattc cacaccgaat cagcaaaaac cacgcaatga tttatattga gagtttgcaa 240
 gcaacaaatt accaaggaga tgcggaaaat acagtaaaac gcgaaacaaa aatcagactt 300
 aaaccgttca acttcagcac aatcttggca tga 333

<210> 58
 <211> 110
 <212> PRT
 <213> Haemophilus influenzae

<400> 58
 Cys Gln Thr Ala Asn Lys Ser Ala Glu Leu Ser Ser Val Val Ala Ile
 1 5 10 15
 Leu Ala Ser Cys Leu Ile Gly Leu Thr Trp Gln Asn Glu Gln Tyr Lys
 20 25 30
 Gln Asp Asn Gly Val Lys Phe Ser Tyr Thr Lys Ile Ala Lys Leu His
 35 40 45
 His Lys Val Thr Asn Thr His Lys Lys Asn Tyr Leu His Gln Ile Pro
 50 55 60
 His Arg Ile Ser Lys Asn His Ala Met Ile Tyr Ile Glu Ser Leu Gln
 65 70 75 80
 Ala Thr Asn Tyr Gln Gly Asp Ala Glu Asn Thr Val Lys Arg Glu Thr
 85 90 95
 Lys Ile Arg Leu Lys Pro Phe Asn Phe Ser Thr Ile Leu Ala
 100 105 110

<210> 59
 <211> 261
 <212> DNA
 <213> Haemophilus influenzae

<400> 59
 ttgcaattaa aaaaatttat tttagaaact cctgaaaata ttctaactga actttgggga 60
 aattacatta aagatgatcg tataactcaa tgggcaaatt tagtggtatc ttattgtaaa 120
 ccttcaaacc acaatgaaat gaaattaatt ttgacaaaaa ttgtaaatga aaaaacaatt 180
 tttaatgata aagatgatgt aaacaaatta gaagaaatgg caaaaatata cataaccaat 240
 cagaaaatta atagtttata a 261

<210> 60
 <211> 86
 <212> PRT
 <213> Haemophilus influenzae

<400> 60
 Leu Gln Leu Lys Lys Phe Ile Leu Glu Thr Pro Glu Asn Ile Leu Thr
 1 5 10 15
 Glu Leu Trp Gly Asn Tyr Ile Lys Asp Asp Arg Ile Thr Gln Trp Ala

		20						25					30			
Asn	Leu	Val	Leu	Ser	Tyr	Cys	Lys	Pro	Ser	Asn	His	Asn	Glu	Met	Lys	
		35					40					45				
Leu	Ile	Leu	Thr	Lys	Ile	Val	Asn	Glu	Lys	Thr	Ile	Phe	Asn	Asp	Lys	
	50				55						60					
Asp	Asp	Val	Asn	Lys	Leu	Glu	Glu	Met	Ala	Lys	Ile	Tyr	Ile	Thr	Asn	
65					70					75					80	
Gln	Lys	Ile	Asn	Ser	Leu											
				85												

<210> 61
 <211> 918
 <212> DNA
 <213> Haemophilus influenzae

<400> 61

atgattttct	ctaaaaataa	gtatccacct	ttacatgaat	tcacgtcatt	aatgaataga	60
gtcgataatt	ttcttaatca	tgatgcagaa	aataggggtg	catactataa	gaaacgtagt	120
ggtattgatt	tagaaaaaga	tgtatatgag	gctatttggt	attgtgctca	aaatactcct	180
ttcgaagaca	ctattagttt	agtatcaggg	aaacattttc	cagacattgt	agctagtcaa	240
tattatggta	ttgaagtaaa	aagtacacaa	ggagataaat	ggacttcaat	tggcagttct	300
attcttgagt	ctacacgaat	tccaaatata	gaaaaaattt	tcttaacatt	tggtaaatta	360
ggtggaaata	ttaaattcct	atccaaacca	tatgagtcgt	gtttatgtga	tatagctgta	420
acccattacc	ctagatataa	aatagatatg	ttattagaaa	agggggagag	catatttgaa	480
aaaatggaga	ccacatatga	ttctctccga	gaattagata	atccaataac	tcctgtagct	540
aaatactata	aatctctatt	aatagaaggt	gaaagtttat	ggtggacttc	aaacaatggt	600
ttagatgata	ttgcccctcc	caaagttaga	cactggaagg	taatagaaaa	atatgagcga	660
gatatgttaa	ttgctcaagc	atatgctttc	ttccctgaaa	cgatcttagg	aaatcctaga	720
aataaatatg	ataaattcgc	actatggcta	gtgactaaac	atggagtaat	aaacactagt	780
ttaagagatg	agttttctgc	aggagggcaa	caaaaaataa	ctgatacttg	tggtgaaaca	840
catctttgtt	ctgctgtatt	aaagagagta	gagaacaata	ttcttgcaat	taaaaaaatt	900
tattttagaa	actcctga					918

<210> 62
 <211> 305
 <212> PRT
 <213> Haemophilus influenzae

<400> 62

Met	Ile	Phe	Ser	Lys	Asn	Lys	Tyr	Pro	Pro	Leu	His	Glu	Phe	Thr	Ser
1				5					10					15	
Leu	Met	Asn	Arg	Val	Asp	Asn	Phe	Leu	Asn	His	Asp	Ala	Glu	Asn	Arg
			20					25				30			
Val	Ala	Tyr	Tyr	Lys	Lys	Arg	Ser	Gly	Ile	Asp	Leu	Glu	Lys	Asp	Val
		35					40				45				
Tyr	Glu	Ala	Ile	Cys	Tyr	Cys	Ala	Gln	Asn	Thr	Pro	Phe	Glu	Asp	Thr
	50			55						60					
Ile	Ser	Leu	Val	Ser	Gly	Lys	His	Phe	Pro	Asp	Ile	Val	Ala	Ser	Gln
65				70					75					80	
Tyr	Tyr	Gly	Ile	Glu	Val	Lys	Ser	Thr	Gln	Gly	Asp	Lys	Trp	Thr	Ser
			85					90					95		
Ile	Gly	Ser	Ser	Ile	Leu	Glu	Ser	Thr	Arg	Ile	Pro	Asn	Ile	Glu	Lys
		100					105					110			
Ile	Phe	Leu	Thr	Phe	Gly	Lys	Leu	Gly	Gly	Asn	Ile	Lys	Phe	Leu	Ser
		115					120					125			

Lys Pro Tyr Glu Ser Cys Leu Cys Asp Ile Ala Val Thr His Tyr Pro
 130 135 140
 Arg Tyr Lys Ile Asp Met Leu Leu Glu Lys Gly Glu Ser Ile Phe Glu
 145 150 155 160
 Lys Met Glu Thr Thr Tyr Asp Ser Leu Arg Glu Leu Asp Asn Pro Ile
 165 170 175
 Thr Pro Val Ala Lys Tyr Tyr Lys Ser Leu Leu Ile Glu Gly Glu Ser
 180 185 190
 Leu Trp Trp Thr Ser Asn Asn Val Leu Asp Asp Ile Ala Pro Pro Lys
 195 200 205
 Val Arg His Trp Lys Val Ile Glu Lys Tyr Glu Arg Asp Met Leu Ile
 210 215 220
 Ala Gln Ala Tyr Ala Phe Phe Pro Glu Thr Ile Leu Gly Asn Pro Arg
 225 230 235 240
 Asn Lys Tyr Asp Lys Phe Ala Leu Trp Leu Val Thr Lys His Gly Val
 245 250 255
 Ile Asn Thr Ser Leu Arg Asp Glu Phe Ser Ala Gly Gly Gln Gln Lys
 260 265 270
 Ile Thr Asp Thr Cys Gly Glu Thr His Leu Cys Ser Ala Val Leu Lys
 275 280 285
 Arg Val Glu Asn Asn Ile Leu Ala Ile Lys Lys Ile Tyr Phe Arg Asn
 290 295 300
 Ser
 305

<210> 63
 <211> 312
 <212> DNA
 <213> Haemophilus influenzae

<400> 63
 ctgttgggcc ccaacaattc cgattctgaa catcatggta atattgaaaa tcgtaggcta 60
 agcatagagc atgaagggaa atatattaac gaattatcta aaggcatgct cgaacgtcgt 120
 cttactataa gagaatgtgc tagattacaa acgttttcctg atagatacca atttatttta 180
 cctaaaacag cagaaaacgt ttctgtttca gccagtaatg cctataaaat tattggcaat 240
 gcggtaccat gtatattagc ttataatatt gctaaaaata tagaaaaaaa atggaatctt 300
 tattttaaat ag 312

<210> 64
 <211> 104
 <212> PRT
 <213> Haemophilus influenzae

<400> 64
 Phe Leu Leu Gly Pro Asn Asn Ser Asp Ser Glu His His Gly Asn Ile
 1 5 10 15
 Glu Asn Arg Arg Leu Ser Ile Glu His Glu Gly Lys Tyr Ile Asn Glu
 20 25 30
 Leu Ser Lys Gly Met Leu Glu Arg Arg Leu Thr Ile Arg Glu Cys Ala
 35 40 45
 Arg Leu Gln Thr Phe Pro Asp Arg Tyr Gln Phe Ile Leu Pro Lys Thr
 50 55 60
 Ala Glu Asn Val Ser Val Ser Ala Ser Asn Ala Tyr Lys Ile Ile Gly
 65 70 75 80
 Asn Ala Val Pro Cys Ile Leu Ala Tyr Asn Ile Ala Lys Asn Ile Glu

85 90 95
 Lys Lys Trp Asn Leu Tyr Phe Lys
 100

<210> 65
 <211> 1464
 <212> DNA
 <213> Haemophilus influenzae

<400> 65
 atgagtgtac tcagttacgc acaaaaaaatc ggtcaagcct taatggtgcc tgtggcagcc 60
 ttacctgctg ctgcattatt aatgggtatt ggctattgga tcgacccaga tgggtgggggt 120
 gcaaatagtc aattagccgc attattaatt aaatctggcg cagcaattat tgacaacatg 180
 ggcttactct tcgctgtggg cgctcgctttt gggcttgcaa aagataaaaca cggttccgcc 240
 gcactttcag gccttgttgg tttctacgta gtaaccaccc tactttcccc tgctggtgta 300
 gcacaattac aacacattga tattagtga gtcctgccg cattcaaaaa aatcaataac 360
 caatttattg ggattttaat tgggtgtgatt tcagctgaac tttacaaccg tttctatcaa 420
 gttgaattac caaaggcact ttcgttcttt agcggaaaac gcctcgtccc aatttttggtt 480
 tctttcgtga tgatcgccgt atcatttgcc ttactctata tttggcctca tatttttaac 540
 gctctcgttt catttgggtga atccatcaaa gatttaggtg cagtaggtgc ggggatctac 600
 ggtttcttca accgcttatt aattcctgta ggcttacacc atgccttaaa ctctgtattc 660
 tggtttgatg tagcgggtat caacgatatt ccaaacttct tgggcggcgc taaatccatt 720
 gccgaaggca ctgcaaccgt ggggctaact ggtatgtatc aagctgggtt cttccctgtc 780
 atgatgtttg gtttaccagg tgctgctctt gcaatttatc actgcgcaaa accaaaccaa 840
 aaagtacaag tggcctcaat tatgcttgcg ggtgcgtag cctcttttctt tacagggatc 900
 actgaaccgc ttgaattctc atttatgttc gttgcacctg tactttatgt attgcatgca 960
 ttattaacag gtatctctgt attcattgca gctacaatgc actggattgc aggattcgga 1020
 tttagtgcag gtttagtgga tatggtactt tctagccgta acccacttgc cgtagctgg 1080
 tataatgttac ttgtacaagg tattgtattc tttgctatct attattttgt gttccgtttt 1140
 gcaattaatg cttttaatct caaaacgcta ggacgtgaag ataaagcgga aacagctgca 1200
 gcccgaactc aaagcgacca atctcgcgaa gaaagagcgg tgaaatttat tgctgcttta 1260
 ggtggttcag aaaacttcaa aactgtggat gcttgatca ctcgtttacy cttaacttta 1320
 gttgatcatc acaatattaa cgaagatcaa cttaaagcgc ttggttcaaa aggtaatgta 1380
 aaattaggca atgatggatt acaagtcatc ttagggcctg aagctgaact tgtggcagat 1440
 gcgattaaag cagaattaaa ataa 1464

<210> 66
 <211> 487
 <212> PRT
 <213> Haemophilus influenzae

<400> 66
 Met Ser Val Leu Ser Tyr Ala Gln Lys Ile Gly Gln Ala Leu Met Val
 1 5 10 15
 Pro Val Ala Ala Leu Pro Ala Ala Leu Leu Met Gly Ile Gly Tyr
 20 25 30
 Trp Ile Asp Pro Asp Gly Trp Gly Ala Asn Ser Gln Leu Ala Ala Leu
 35 40 45
 Leu Ile Lys Ser Gly Ala Ala Ile Ile Asp Asn Met Gly Leu Leu Phe
 50 55 60
 Ala Val Gly Val Ala Phe Gly Leu Ala Lys Asp Lys His Gly Ser Ala
 65 70 75 80
 Ala Leu Ser Gly Leu Val Gly Phe Tyr Val Val Thr Thr Leu Leu Ser
 85 90 95
 Pro Ala Gly Val Ala Gln Leu Gln His Ile Asp Ile Ser Glu Val Pro

			100					105				110			
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		115					120					125			
Val	Ile	Ser	Ala	Glu	Leu	Tyr	Asn	Arg	Phe	Tyr	Gln	Val	Glu	Leu	Pro
		130					135				140				
Lys	Ala	Leu	Ser	Phe	Phe	Ser	Gly	Lys	Arg	Leu	Val	Pro	Ile	Leu	Val
145					150					155					160
Ser	Phe	Val	Met	Ile	Ala	Val	Ser	Phe	Ala	Leu	Leu	Tyr	Ile	Trp	Pro
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His	Ile	Phe	Asn	Ala	Leu	Val	Ser	Phe	Gly	Glu	Ser	Ile	Lys	Asp	Leu
			180						185				190		
Gly	Ala	Val	Gly	Ala	Gly	Ile	Tyr	Gly	Phe	Phe	Asn	Arg	Leu	Leu	Ile
		195					200					205			
Pro	Val	Gly	Leu	His	His	Ala	Leu	Asn	Ser	Val	Phe	Trp	Phe	Asp	Val
210						215					220				
Ala	Gly	Ile	Asn	Asp	Ile	Pro	Asn	Phe	Leu	Gly	Gly	Ala	Lys	Ser	Ile
225					230					235					240
Ala	Glu	Gly	Thr	Ala	Thr	Val	Gly	Leu	Thr	Gly	Met	Tyr	Gln	Ala	Gly
			245						250					255	
Phe	Phe	Pro	Val	Met	Met	Phe	Gly	Leu	Pro	Gly	Ala	Ala	Leu	Ala	Ile
			260					265					270		
Tyr	His	Cys	Ala	Lys	Pro	Asn	Gln	Lys	Val	Gln	Val	Ala	Ser	Ile	Met
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Leu	Ala	Gly	Ala	Leu	Ala	Ser	Phe	Phe	Thr	Gly	Ile	Thr	Glu	Pro	Leu
		290				295					300				
Glu	Phe	Ser	Phe	Met	Phe	Val	Ala	Pro	Val	Leu	Tyr	Val	Leu	His	Ala
305					310					315					320
Leu	Leu	Thr	Gly	Ile	Ser	Val	Phe	Ile	Ala	Ala	Thr	Met	His	Trp	Ile
			325						330					335	
Ala	Gly	Phe	Gly	Phe	Ser	Ala	Gly	Leu	Val	Asp	Met	Val	Leu	Ser	Ser
			340					345					350		
Arg	Asn	Pro	Leu	Ala	Val	Ser	Trp	Tyr	Met	Leu	Leu	Val	Gln	Gly	Ile
		355					360					365			
Val	Phe	Phe	Ala	Ile	Tyr	Tyr	Phe	Val	Phe	Arg	Phe	Ala	Ile	Asn	Ala
		370				375					380				
Phe	Asn	Leu	Lys	Thr	Leu	Gly	Arg	Glu	Asp	Lys	Ala	Glu	Thr	Ala	Ala
385					390					395					400
Ala	Pro	Thr	Gln	Ser	Asp	Gln	Ser	Arg	Glu	Glu	Arg	Ala	Val	Lys	Phe
			405						410					415	
Ile	Ala	Ala	Leu	Gly	Gly	Ser	Glu	Asn	Phe	Lys	Thr	Val	Asp	Ala	Cys
			420					425					430		
Ile	Thr	Arg	Leu	Arg	Leu	Thr	Leu	Val	Asp	His	His	Asn	Ile	Asn	Glu
		435					440					445			
Asp	Gln	Leu	Lys	Ala	Leu	Gly	Ser	Lys	Gly	Asn	Val	Lys	Leu	Gly	Asn
450					455					460					
Asp	Gly	Leu	Gln	Val	Ile	Leu	Gly	Pro	Glu	Ala	Glu	Leu	Val	Ala	Asp
465					470					475					480
Ala	Ile	Lys	Ala	Glu	Leu	Lys									
			485												

<210> 67
 <211> 888
 <212> DNA
 <213> Haemophilus influenzae

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ctagaagaaa aattgggtgt gaacctaatc aaccgcacta ctagacagct tagactaaca      180
gaagaaggct tacaatatct tcgtcgcgta cagaaaattc tgcaagatat ggctgcagct      240
gaagctgaaa tgttggcagt gcacgaagtc ccacaaggca tactacgcgt agattcagcc      300
atgccgatgg tgttacatct gctagtgccca ctggcagcaa aattcaacga acgctatccg      360
catatccaac tttcgttagt ttcttctgaa ggctatatca atctgataga acgcaaagtc      420
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gatagccact tccgcgtaat cgccagtcca gactacttgg caaacacacg cagccacaaa      540
tcaactgaag ctcttgccaa ccatcaatgt ttaggcttca ctgagcccag ttcactaaat      600
acatgggaag ttttagatgc tcaaggaaat ccctataaaa tctcaccgta ctttaccgcc      660
agcagcgggt aaattttacg gtcatttgtt ctttcaggct gtggtattgc ttgcttatca      720
gattttttgg tagacaatga catcgctgaa ggaaaattaa ttcccttact tactgaacaa      780
accgccataa aaacgctccc cttcaatgct gtttactaca gcgataaagc agtcaacctt      840
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<210> 68
<211> 295
<212> PRT
<213> Haemophilus influenzae

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Ala Val Ser Arg Val Val Lys Arg Leu Glu Glu Lys Leu Gly Val Asn
 35          40          45
Leu Ile Asn Arg Thr Thr Arg Gln Leu Arg Leu Thr Glu Glu Gly Leu
 50          55          60
Gln Tyr Phe Arg Arg Val Gln Lys Ile Leu Gln Asp Met Ala Ala Ala
 65          70          75          80
Glu Ala Glu Met Leu Ala Val His Glu Val Pro Gln Gly Ile Leu Arg
 85          90          95
Val Asp Ser Ala Met Pro Met Val Leu His Leu Leu Val Pro Leu Ala
100          105          110
Ala Lys Phe Asn Glu Arg Tyr Pro His Ile Gln Leu Ser Leu Val Ser
115          120          125
Ser Glu Gly Tyr Ile Asn Leu Ile Glu Arg Lys Val Asp Ile Ala Leu
130          135          140
Arg Ala Gly Glu Leu Asp Asp Ser Gly Leu Arg Ala Arg His Leu Phe
145          150          155          160
Asp Ser His Phe Arg Val Ile Ala Ser Pro Asp Tyr Leu Ala Lys His
165          170          175
Gly Thr Pro Gln Ser Thr Glu Ala Leu Ala Asn His Gln Cys Leu Gly
180          185          190
Phe Thr Glu Pro Ser Ser Leu Asn Thr Trp Glu Val Leu Asp Ala Gln
195          200          205
Gly Asn Pro Tyr Lys Ile Ser Pro Tyr Phe Thr Ala Ser Ser Gly Glu
210          215          220
Ile Leu Arg Ser Leu Cys Leu Ser Gly Cys Gly Ile Ala Cys Leu Ser
225          230          235          240
Asp Phe Leu Val Asp Asn Asp Ile Ala Glu Gly Lys Leu Ile Pro Leu
245          250          255

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Leu Thr Glu Gln Thr Ala Asn Lys Thr Leu Pro Phe Asn Ala Val Tyr
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 Tyr Ser Asp Lys Ala Val Asn Leu Arg Leu Arg Val Phe Leu Asp Phe
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 Leu Val Glu Glu Leu Arg Gly
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<210> 69
 <211> 843
 <212> DNA
 <213> Haemophilus influenzae

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 aaaattacga cattagcaac cacagcggga aaaccaataa accccaaatc ggaaaaatat 240
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 gcaatggcat ttgaaggtta taagaaacaa gtacaagaac aagaccctaa attacatcag 660
 caacttctgc aaattgccgt ggataatttg gggataaatc caaccaaagt ctttgacaaa 720
 gatttaaaaa gcacaccact tgaaacaatt atcgatggag taggaaaacg cctggataaa 780
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<210> 70
 <211> 280
 <212> PRT
 <213> Haemophilus influenzae

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 Glu Ile Ser Gln Trp His Glu Gln Ser Glu Lys Leu Ser Gly Asp Ile
 35 40 45
 Ser Asn Tyr Glu Phe Thr Ala Gln Asn Asn Leu Thr Lys Ile Thr Thr
 50 55 60
 Leu Ala Thr Thr Ala Gly Lys Pro Ile Asn Pro Lys Ser Glu Lys Tyr
 65 70 75 80
 His Glu Asp Ile Glu Gly Met Ile Lys Leu Phe Asn Lys Gln Lys Glu
 85 90 95
 Glu Ile Glu Met Ile Ile Glu Asp Ala Asn Arg Ala Ser Met Ala Gly
 100 105 110
 Ser Phe Lys Thr Gln Ser Glu Asn Ile Asp Ser Lys Met Lys Ala Val
 115 120 125
 Asp Lys Ile Leu Pro Trp Gly His Leu Val Ala Thr Ser Val Ile Ser
 130 135 140
 Leu Phe Asn Tyr Ser Thr Ser Leu Ser Ala Ala Asp Ser Leu Asn Ile
 145 150 155 160

<210> 73
 <211> 675
 <212> DNA
 <213> Haemophilus influenzae

<400> 73
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 gaaaatgaat ggggtaccgt ttcgcccacc tcttttgaga caatttttgc taatgatatt 180
 aaacctgatg ctaaagcagc atgggtttct tatttcttag accaaaaagc gaatgcaaac 240
 gaaatctacc acttagaaag cattgttgat cttgtaaaaa aagaacggga aactcacaat 300
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 gccggaaaac gattaggatt tgattctcac aaaaatcatc atggaaaaat atcaaata 420
 gatgaacctt caattgaaaa tagaggacaa ttatacatgt ggatgagaga agtaatatct 480
 ataactcacc ccaaattatt catagctgaa aatgtaaaag gattaacgaa ccttaaagat 540
 gtaaaaagaaa ttattgaaca tgattttggt caagctagtg acgaaggata cttaattgta 600
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<210> 74
 <211> 224
 <212> PRT
 <213> Haemophilus influenzae

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 20 25 30
 His Pro Glu Trp Ile Ser Ser Thr Glu Asn Glu Trp Val Thr Val Ser
 35 40 45
 Pro Thr Ser Phe Glu Thr Ile Phe Ala Asn Asp Ile Lys Pro Asp Ala
 50 55 60
 Lys Ala Ala Trp Val Ser Tyr Phe Leu Asp Gln Lys Ala Asn Ala Asn
 65 70 75 80
 Glu Ile Tyr His Leu Glu Ser Ile Val Asp Leu Val Lys Lys Glu Arg
 85 90 95
 Glu Thr His Asn Ile Phe Pro Lys Gly Ile Asp Ile Leu Thr Gly Gly
 100 105 110
 Phe Pro Cys Gln Asp Phe Ser Val Ala Gly Lys Arg Leu Gly Phe Asp
 115 120 125
 Ser His Lys Asn His His Gly Lys Ile Ser Asn Ile Asp Glu Pro Ser
 130 135 140
 Ile Glu Asn Arg Gly Gln Leu Tyr Met Trp Met Arg Glu Val Ile Ser
 145 150 155 160
 Ile Thr His Pro Lys Leu Phe Ile Ala Glu Asn Val Lys Gly Leu Thr
 165 170 175
 Asn Leu Lys Asp Val Lys Glu Ile Ile Glu His Asp Phe Gly Gln Ala
 180 185 190
 Ser Asp Glu Gly Tyr Leu Ile Val Pro Ala Ser Val Leu Asn Ala Gln
 195 200 205
 Phe Tyr Gly Ala Pro Gln Ser Arg Glu Arg Val Ile Phe Phe Trp Phe
 210 215 220

<210> 75
 <211> 6808
 <212> DNA
 <213> Haemophilus influenzae

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acgaattcga agcaattgta aaagacagtt tgaagaaagt ttcaaaaaat gttgaaatTT      240
tattttatga tcatggtaaa gcaaaaagtt attgctggaa aaaaacactt gtcaaaaatt      300
accgtttagt tcactatcgt aaaccctcta aaacgtctaa acgtgcaatc atgtgtacaa      360
cagcttattt aattacttta tctggcgctc aaaaactcct acaaatagcc taccctatcc      420
gtatgcctgc tgactactta actggtgctt tacaattaac tggactaaag gcttatgggtg      480
ttgaaccacc ttgtgtattt aaaggcgcaa tttcagaaat tgatgcaatg gagcaacgct      540
aacaatgaaa ttaaaaaata aattacaaat gttaagggtg ggtctaggca aatatttcct      600
tgataaaaaa aacggattaa acagaataac aaatgttcct agaagcatcc tcttctcccg      660
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<213> Haemophilus influenzae

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<211> 2247

<212> DNA

<213> Haemophilus influenzae

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<210> 81
 <211> 1961
 <212> DNA
 <213> Haemophilus influenzae

<400> 81
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<210> 82
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 <212> DNA
 <213> Haemophilus influenzae

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<210> 83

<211> 1516

<212> DNA

<213> Haemophilus influenzae

<400> 83

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<210> 84
 <211> 1132
 <212> DNA
 <213> Haemophilus influenzae

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<210> 85
 <211> 1100
 <212> DNA
 <213> Haemophilus influenzae

<400> 85
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 gacattcccg actttctggt gaaagtgtgg ttatcttaat ccgaagttag ggcggtgtca 180
 aataaaaagc gctgagaatt tgagggagcg agttattcat catcaattaa ttcttttggg 240
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<210> 86
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 <212> DNA

<213> Haemophilus influenzae

<400> 86

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<210> 87

<211> 1048

<212> DNA

<213> Haemophilus influenzae

<400> 87

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